

Features

- Input Voltage Range : 1.2V to 5.5V
- 8μA 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
- DFN-4L 1x1 Packages

Applications

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

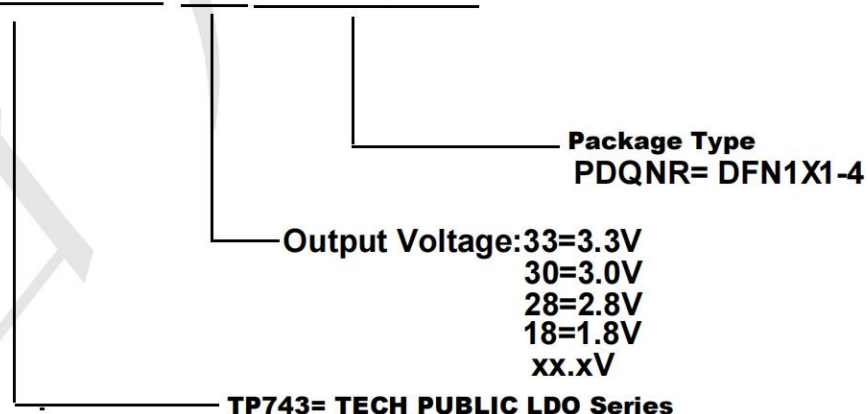
General Description

The 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.

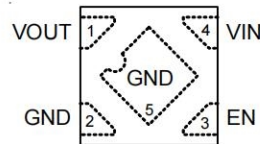
The feature of 8μA low quiescent current and 0.5μA shutdown current are ideal for the battery application with long service life. The other features include current limit function, over temperature protection and output discharge function.

Ordering Information

TP74333PDQNR

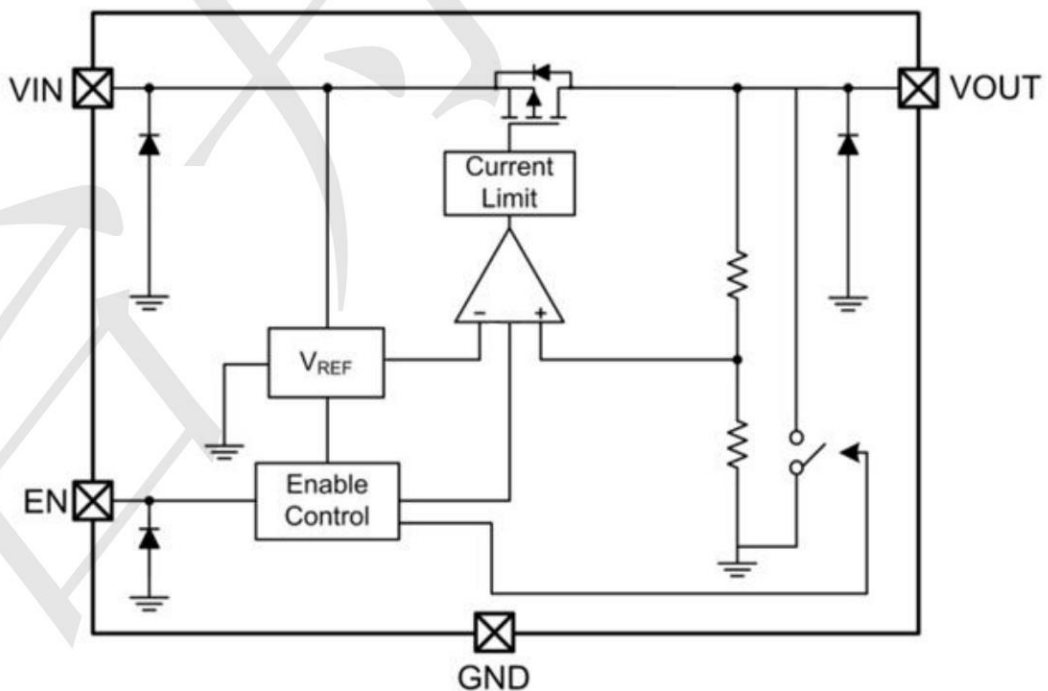


Pin Configuration



PIN	Symbol	Description
1	VOUT	Output
2	GND	Ground
3	EN	Enable (Active high, not floating)
4	VIN	Input

BLOCK DIAGRAM



Absolute Maximum Rating (T_A=25°C unless otherwise noted)

• VIN, VOUT, EN to GND	-----	-0.3V to 6.5V
• VOUT to VIN	-----	-6.5V to 0.3V
DFN-4L 1x1	-----	0.44W
• Package Thermal Resistance (Note 2)		
DFN-4L 1x1 θ _{JA}	-----	226°C/W
DFN-4L 1x1 θ _{JC}	-----	43°C/W
• Lead Temperature (Soldering, 10 sec.)	-----	260°C
• Junction Temperature	-----	150°C
• Storage Temperature Range	-----	-65°C to 150°C
• ESD Susceptibility (Note 3)		
HBM (Human Body Model)	-----	2kV

Recommended Operating Conditions (Note 4)

• Input Voltage, VIN	-----	1.2V to 5.5V
• Junction Temperature Range	-----	-40°C to 125°C

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}	--	8		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

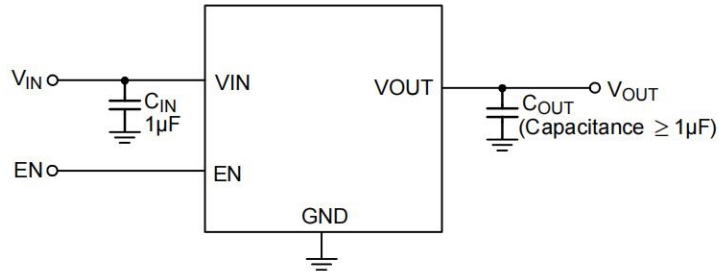
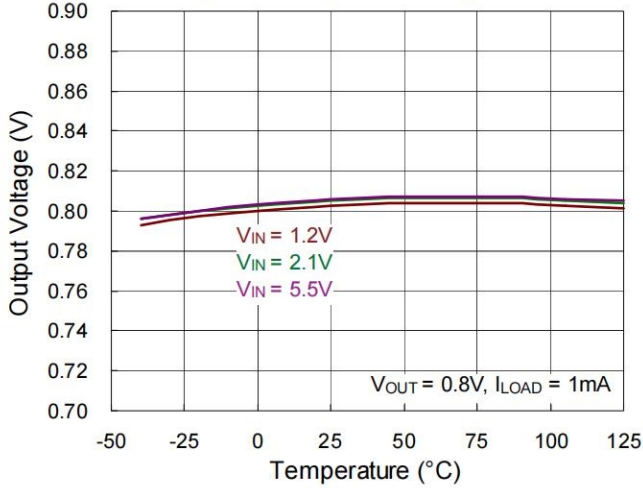


Table 1. Recommended External Components

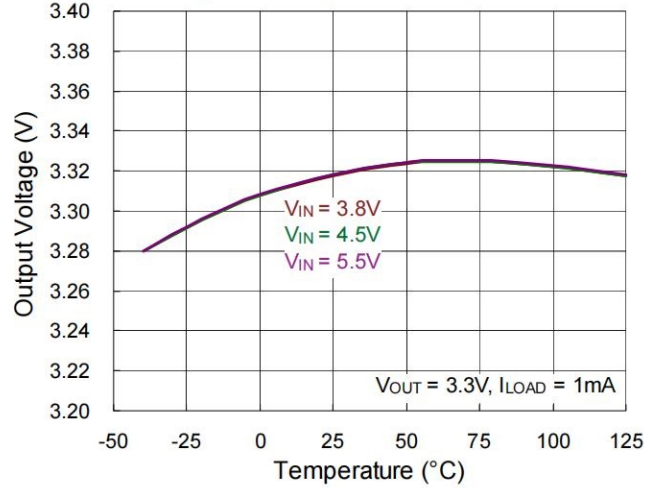
Component	Description	Vendor P/N
C _{IN}	1µF, 10V, X5R, 0402	GRM155R61A105KE15 (Murata)
* C _{OUT}	1µF, 6.3V, X5R, 0402	GRM153R60J105ME95(Murata) CGB2A3X5R0J105M033BB(TDK)
	2.2µF, 6.3V, X5R, 0402	GRM153R60J225ME95 (Murata) C1005X5R0J225M050BC (TDK)
	4.7µF, 6.3V, X5R, 0402	GRM153R60J475ME15 (Murata) C1005X5R0J475K050BE(TDK)

Typical Operating Characteristics

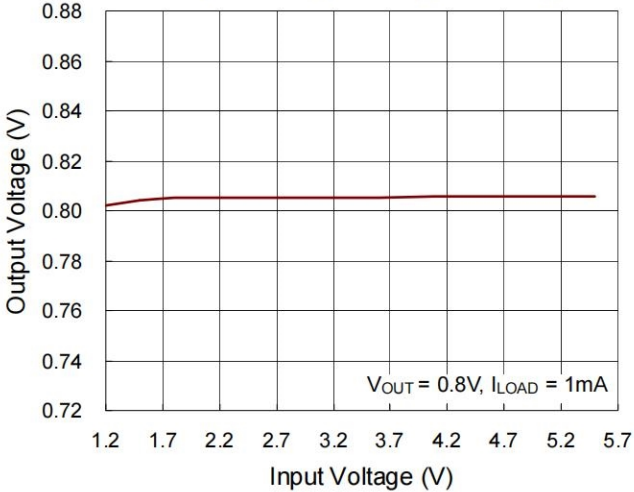
Output Voltage vs. Temperature



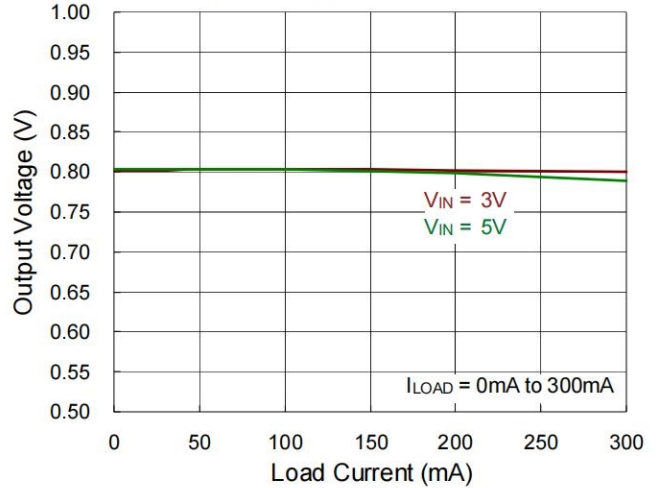
Output Voltage vs. Temperature



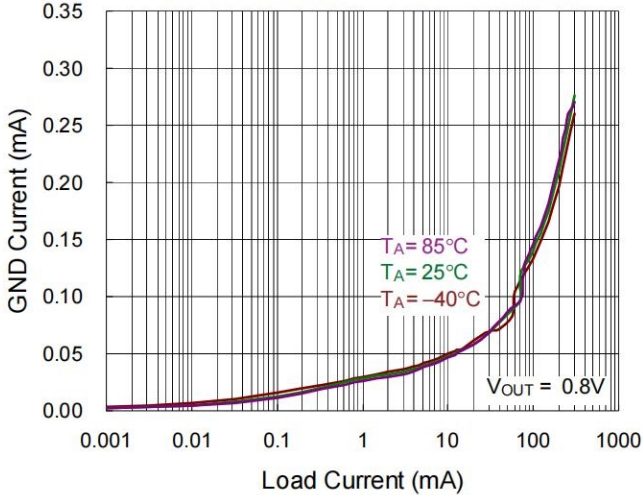
Output Voltage vs. Input Voltage



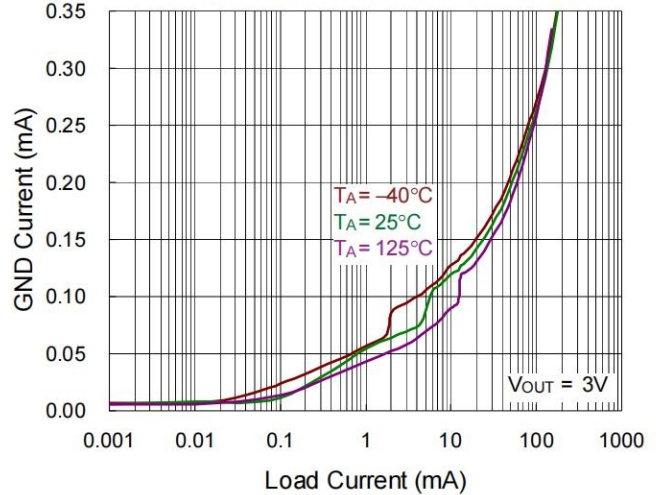
Output Voltage vs. Load Current

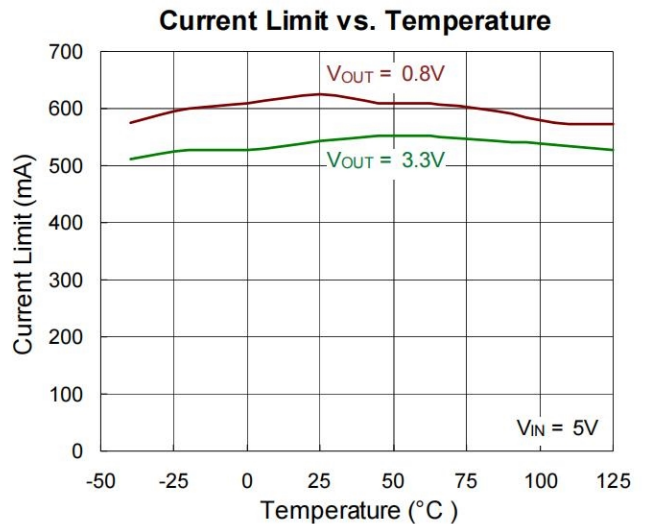
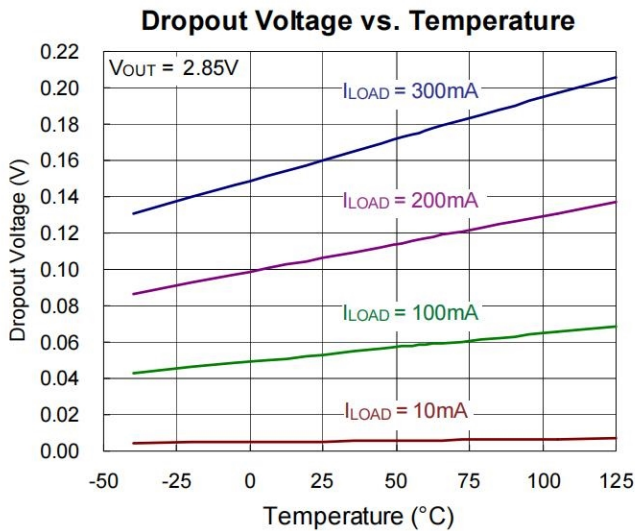
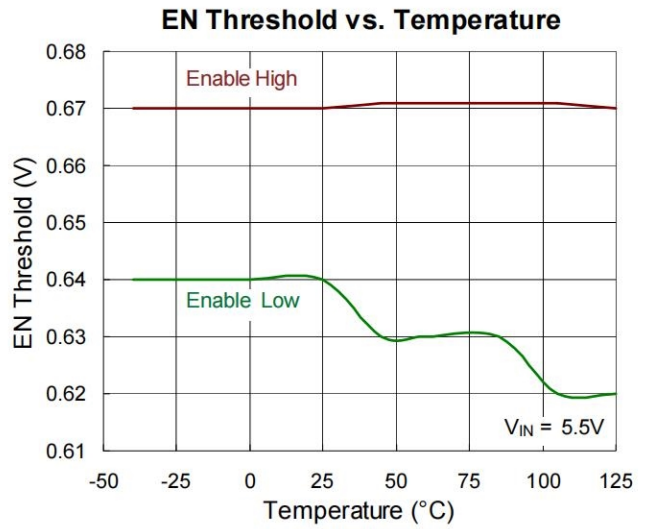
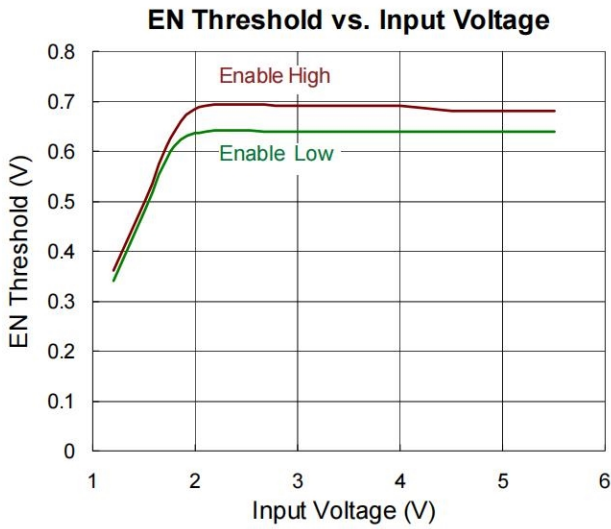
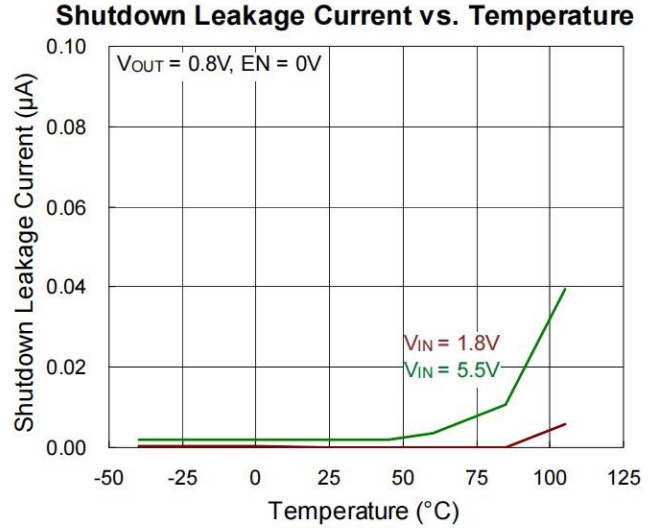
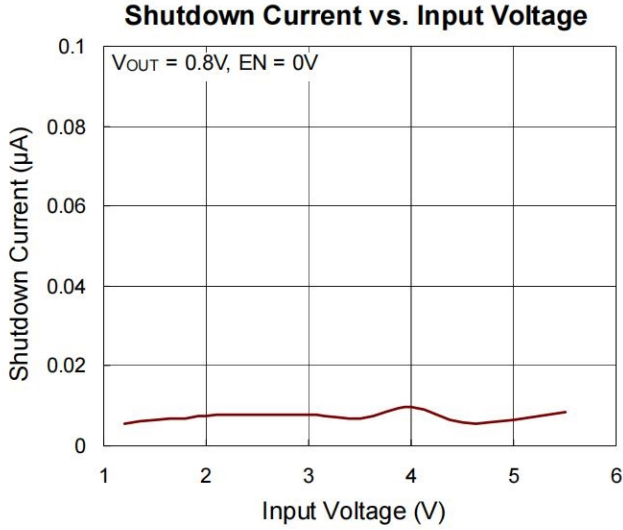


Ground Current vs. Load Current

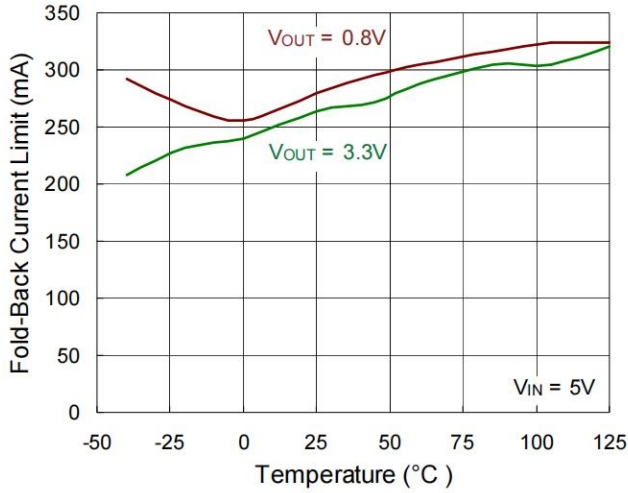


Ground Current vs. Load Current

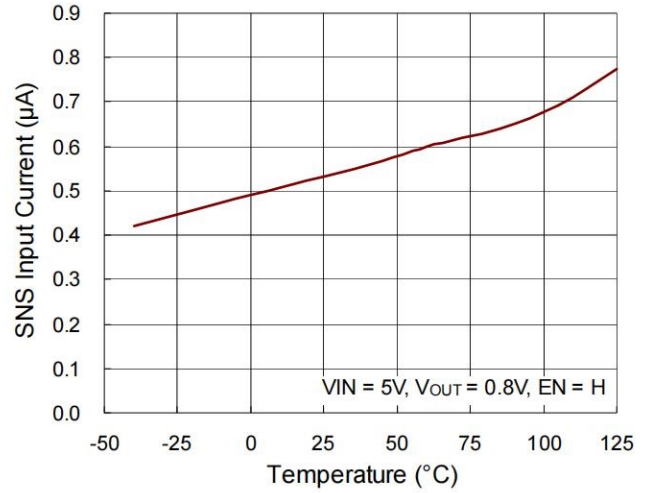




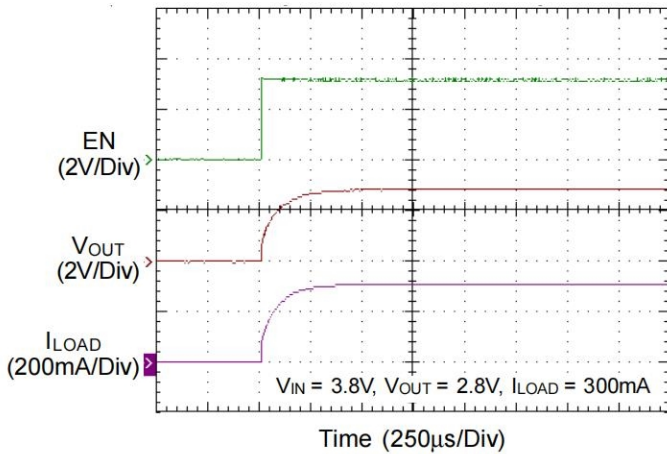
Fold-Back Current Limit vs. Temperature



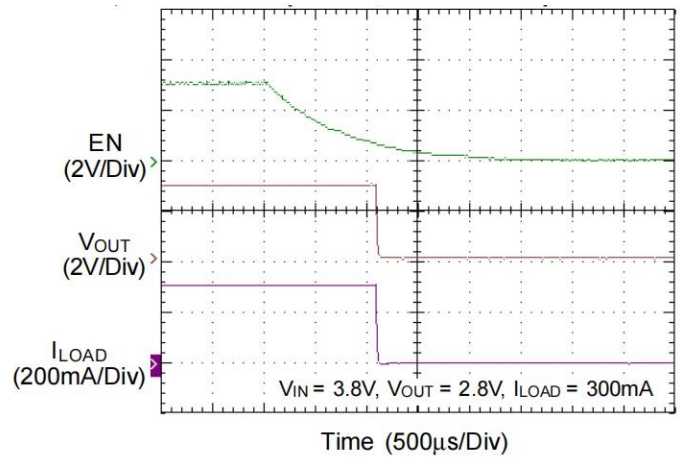
SNS Input Current vs. Temperature



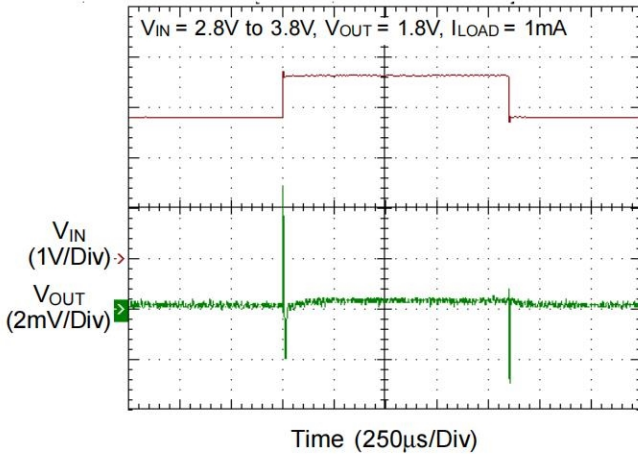
Power On from EN



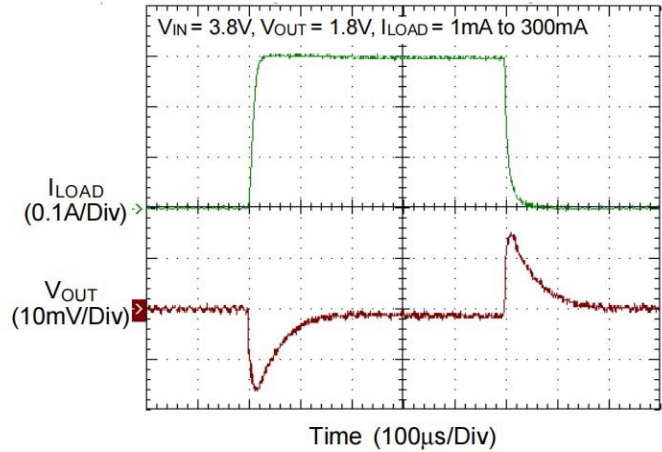
Power Off from EN



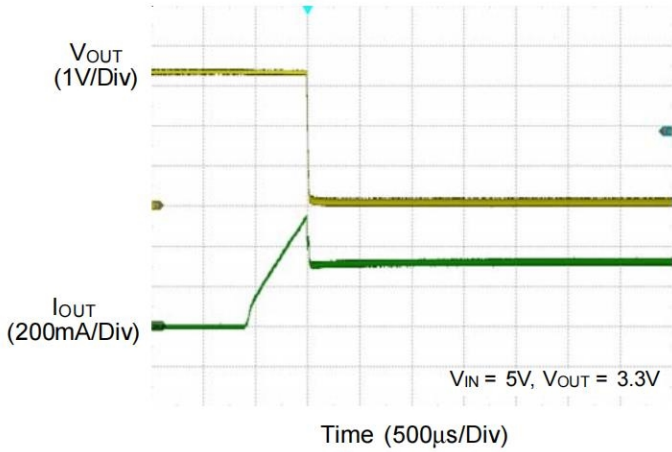
Line Transient



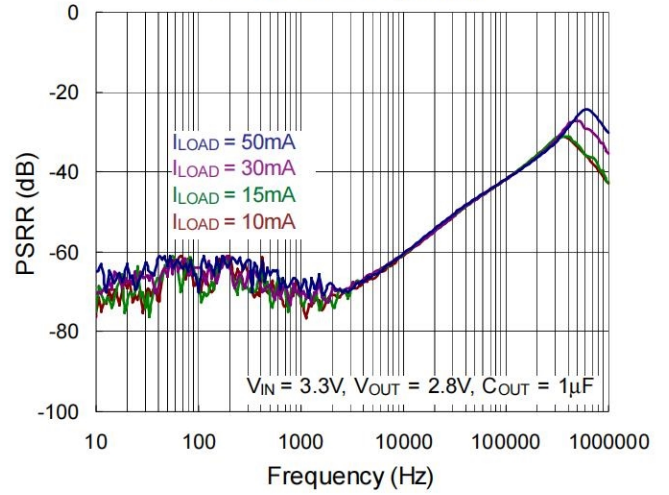
Load Transient



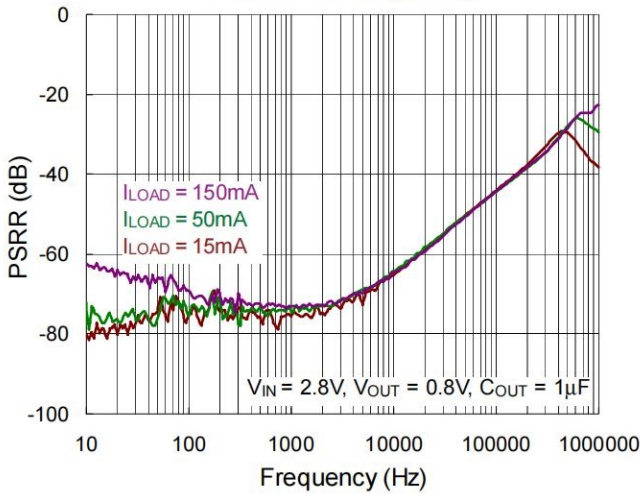
Output Current Limit Protection



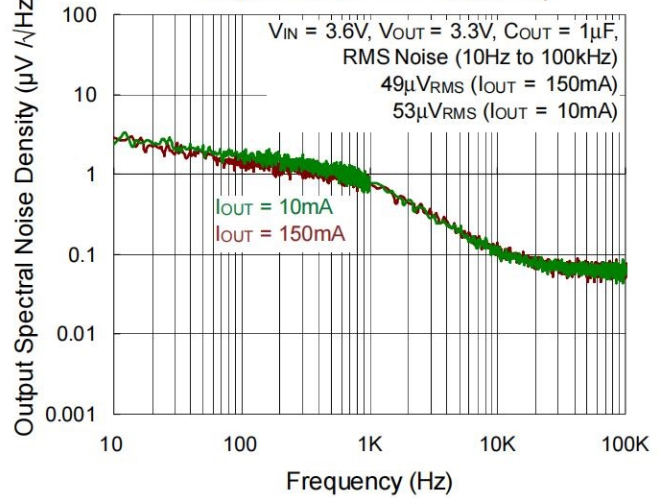
PSRR vs. Frequency



PSRR vs. Frequency



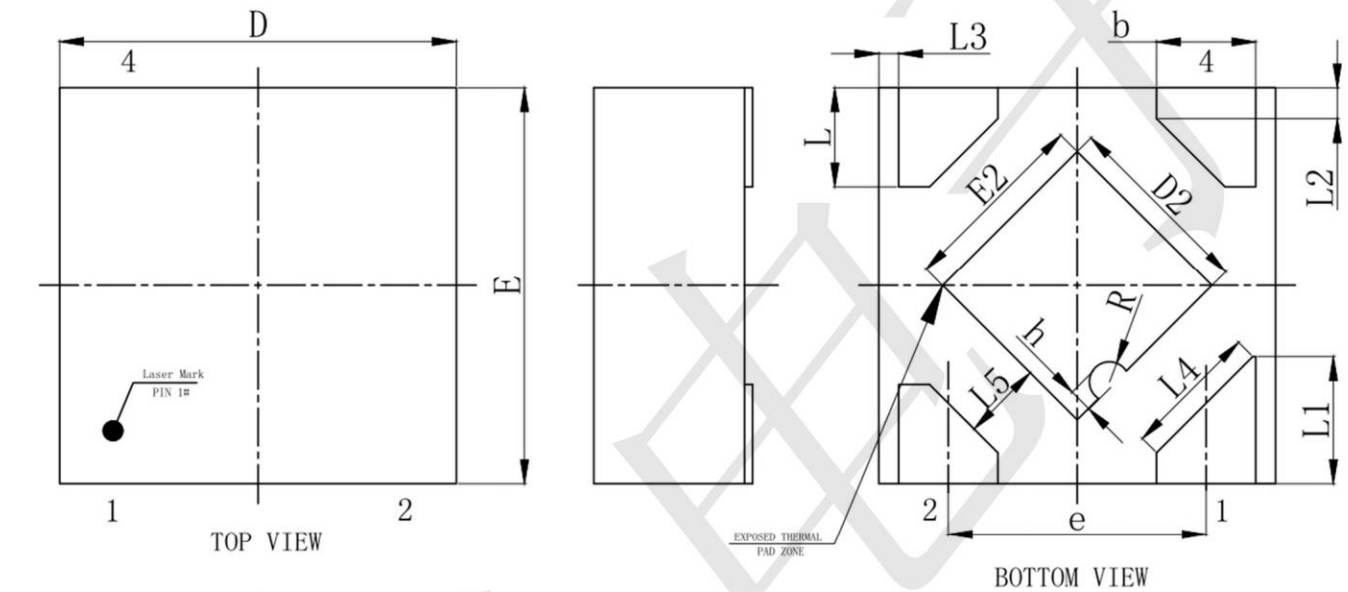
Output Noise vs. Frequency



Package informantion

DFN1X1-4 Outline Dimensions

DFN-4L



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		

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