

GS2823 Series

300mA High PSRR Low Dropout Voltage Linear Regulator

Product Description

The GS2823 is a low dropout and low noise linear regulator with high ripple rejection ratio and fast turn-on time. GS2823 is a fixed output voltage type. It has a fixed output voltage ranging from 1.2V to 4V.

The GS2823 includes a voltage reference unit, an error amplifier, resistor net for voltage setting, a current limit circuit and a chip enable circuit.

The GS2823 works well with low ESR ceramic capacitors, suitable for portable RF and wireless battery-powered applications with stringent space requirements and demanding performance. It also offers ultra low noise output and has low quiescent current.

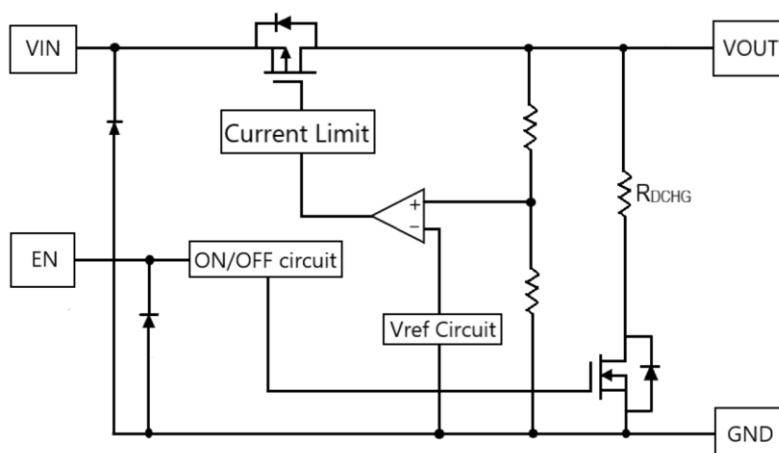
Features

- Output Current: 300mA
- High Ripple Rejection: 80dB (Typ) ($f=1\text{kHz}$)
- Output Voltage:
Vout $\geq 2\text{V}$ (Accuracy $\pm 1.0\%$)
Vout $< 2\text{V}$ (Accuracy $\pm 20\text{mV}$)
- Low Supply Current: 150 μA (Typ)
- Standby Current: 0.1 μA (Typ)
- EN Function: Active High
- Operating Ambient Temperature: $-40\sim+85^{\circ}\text{C}$
- Current Limit and Short Circuit Protection
- Fixed Output Voltage: 1.2V to 4.0V
- Low ESR Capacitors: C_{in}=1 μF , C_L=1 μF
- Small Packages: SOT-23, SOT-23-5L, DFN1x1-4L/ DFN1x1-4L(A)
- RoHS Compliant & Halogen Free

Applications

- Mobile Devices
- Portable Communication Equipment
- Modules
- Hand-Held Instruments
- Wireless Communications

Functional Block Diagram



Packages & Pin Assignments

SOT-23	SOT-23-5L	DFN1X1-4L DFN1X1-4L(A)
Pin Name	Function	
V _{IN}	Power Supply Input.	
V _{OUT}	The pin is the power output of the device.	
GND	Ground Pin.	
EN	Enable Input. Pulling this pin below 0.3V turn the regulator off, reducing the quiescent current to a fraction of its operating value. The device will be enabled if this pin is left open. Connect to V _{IN} if not being used.	
NC	No Connect.	

Ordering and Marking Information

Ordering Information						
V _{OUT}	SOT-23	SOT-23-5L	Marking	DFN1x1-4L	DFN1x1-4L(A)	Marking
1.2V	GS2823Z12F	GS2823L12F	CXD□□□	GS2823F12F1	GS2823F12F	XD □□
1.5V	GS2823Z15F	GS2823L15F	CXG□□□	GS2823F15F1	GS2823F15F	XG □□
1.8V	GS2823Z18F	GS2823L18F	CXF□□□	GS2823F18F1	GS2823F18F	XF □□
2.5V	GS2823Z25F	GS2823L25F	CXH□□□	GS2823F25F1	GS2823F25F	XH □□
2.8V	GS2823Z28F	GS2823L28F	CXJ□□□	GS2823F28F1	GS2823F28F	XJ □□
2.9V	GS2823Z29F	GS2823L29F	CXP□□□	GS2823F29F1	GS2823F29F	XP □□
3.3V	GS2823Z33F	GS2823L33F	CXR□□□	GS2823F33F1	GS2823F33F	XR □□
4.0V	GS2823Z40F	GS2823L40F	CXU□□□	GS2823F40F1	GS2823F40F	XU □□

Quantity/Reel			
SOT-23 (GS2823Z□□F)	SOT-23-5L (GS2823L□□F)	DFN1x1-4L (GS2823F□□F1)	DFN1x1-4L(A) (GS2823F□□F)
3,000 PCS	3,000 PCS	3,000 PCS	10,000 PCS

GS2823 1 2 2 3 4			
Product Name: GS2823	Package Code: 1 is Z, L and F - Z for SOT-23 - L for SOT-23-5L - F for DFN1x1-4L/(A)	Voltage Code: 2 2 is 12, 15, 18 and so on. - 12 for 1.2V, 15 for 1.5V, 18 for 1.8V and so on.	
Green Level: 3 is F stands for RoHS Compliant and Halogen Free	Dedicated Code (Only for DFN1x1-4L or DFN1x1-4L(A) Package): 4 is Blank or 1 - Blank for DFN1x1-4L(A) with 10KPCS/Reel - 1 for DFN1x1-4L with 3KPCS/Reel		

Marking Information	
CX 1 2 2 2	X 1 2 2
Product Code: - CX for SOT-23 and SOT-23-5L package - X for DFN1x1-4L/(A)	Voltage Code: 1 is D, G, F and so on. - D for 1.2V - G for 1.5V - F for 1.8V - H for 2.5V - J for 2.8V - P for 2.9V - R for 3.3V - U for 4.0V
	GS Code: 2 is GS Code

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

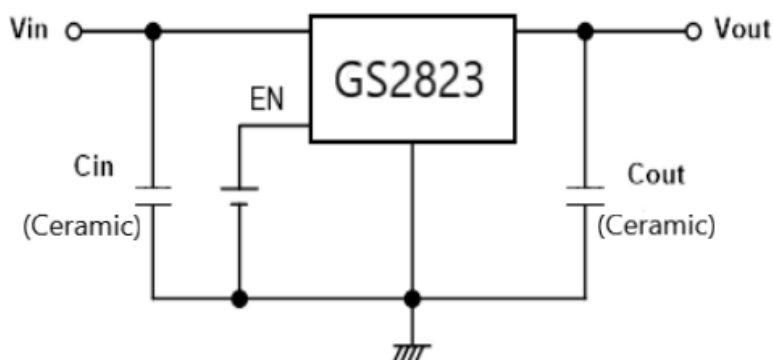
Symbol	Parameter	Value	Units
V _{IN}	Power Supply Voltage	7.0	V
V _{EN}	Enable Voltage	7.0	V
V _{OUT}	Output Voltage	-0.3 to V _{IN}	V
I _{OUT}	Output Current	500	mA
P _D	Total Power Dissipation	SOT-23	560
		SOT-23-5L	600
		DFN1x1-4L/(A)	340
T _{STG}	Storage Temperature Range	-55 to +125	°C
T _A	Operating Ambient Temperature	-40 to +85	°C
T _J	Operating Junction Temperature	+125	°C
T _{LEAD}	Lead Temperature(soldering) 5sec.	260	°C
R _{θJA}	Thermal Resistance, Junction to Ambient	SOT-23	179
		SOT-23-5L	166
		DFN1x1-4L/(A)	294

Electrical Characteristics (Unless otherwise specified V_{IN}=V_{OUT}+1V, T_A=25°C)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
I _{SS}	Supply Current	V _{IN} =V _{OUT} +1.0V, En pin=ON, No Load	-	150	-	μA
I _{stand-by}	Standby Current	V _{IN} =V _{OUT} +1.0V, En pin=OFF, No Load	-	0.01	0.4	μA
V _{IN}	Input Voltage	-	1.6	-	5.5	V
V _{OUT}	Output Voltage	V _{IN} =V _{OUT} +1.0V I _{OUT} = 10mA	V _{OUT} <2.0V	V _{OUT} -0.02	V _{OUT} +0.02	V
			V _{OUT} ≥2V	V _{OUT} x0.99	V _{OUT} x1.01	
I _{OUTMAX}	Max Output Current	V _{IN} ≥V _{OUT} +1.0V	1.2V≤V _{OUT} ≤4.0V	300	-	mA
ΔV _{LINE}	Line regulation	V _{OUT} +0.5V≤V _{IN} ≤5.5V I _{OUT} = 50mA	1.2V≤V _{OUT} ≤4.0V	-	0.01	%/V
ΔV _{LOAD}	Load Regulation	V _{IN} =V _{OUT} +1V 0.1mA≤I _{OUT} ≤300mA	1.2V≤V _{OUT} ≤4.0V	-	25	mV
V _{DROP}	Dropout Voltage	I _{OUT} = 300mA	1.2V≤V _{OUT} <1.3V	-	0.48	V
			1.3V≤V _{OUT} <1.4V	-	0.44	
			1.4V≤V _{OUT} <1.5V	-	0.42	
			1.5V≤V _{OUT} <1.6V	-	0.42	
			1.6V≤V _{OUT} <1.8V	-	0.40	
			1.8V≤V _{OUT} <2.0V	-	0.30	
			2.0V≤V _{OUT} <2.5V	-	0.27	
			2.5V≤V _{OUT} <3.0V	-	0.24	
			3.0V≤V _{OUT} ≤4.0V	-	0.20	

$\Delta V_{OUT}/\Delta T$	Output Voltage Temperature Coefficient	$V_{IN}=V_{OUT}+1V$, $I_{OUT}=10mA$, $-40^{\circ}C \leq T_A \leq 85^{\circ}C$	-	± 100	-	ppm/ $^{\circ}C$
PSRR	Power Supply Rejection Ratio	$V_{IN}=V_{OUT}+1V$ $I_{OUT}=30mA$, $f=1KHZ$	-	80	-	dB
$V_{EN(HI)}$	EN Input High Voltage	$V_{IN}=V_{OUT}+1V$	1.0	-	-	V
$V_{EN(LO)}$	EN Input Low Voltage	$V_{IN}=V_{OUT}+1V$	-	-	0.3	V
$I_{EN(HI)}$	EN Input High Current	$V_{IN}=V_{EN}=5.5V$	3.0	5.5	9.0	μA
$I_{EN(LO)}$	EN Input Low Current	$V_{EN}=0V$	-0.1	-	0.1	μA
I_{short}	Short-Circuit Current	$V_{IN}=V_{OUT}+1.0V$, En Pin=ON, $V_{OUT}=0V$	-	50	-	mA
I_{LIM}	Current Limit	$V_{IN}=V_{EN}$	310	400	-	mA
I_{RUSH}	Inrush Current	$V_{IN}=5.5V$, $V_{EN}=0 \sim 5.5V$	-	150	-	mA
R_{DCHG}	On Resistance for Discharge	$V_{IN}=5.5V$, $V_{OUT}=2V$, $V_{EN}=0V$	-	280	-	Ω

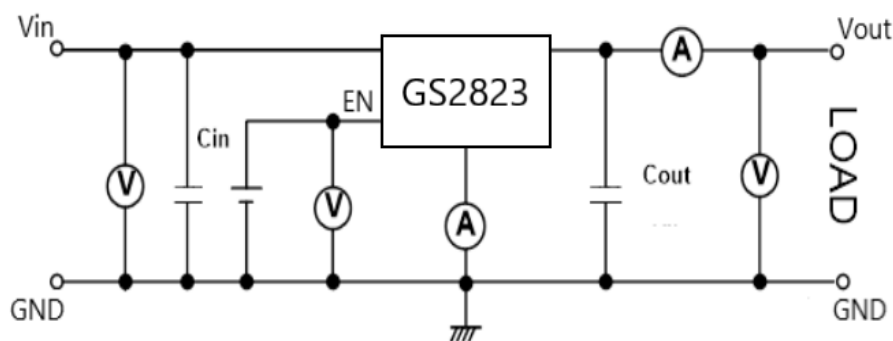
Typical Applications



C_{IN} : $1\mu F$ or more. C_{OUT} : $1\mu F$ or more

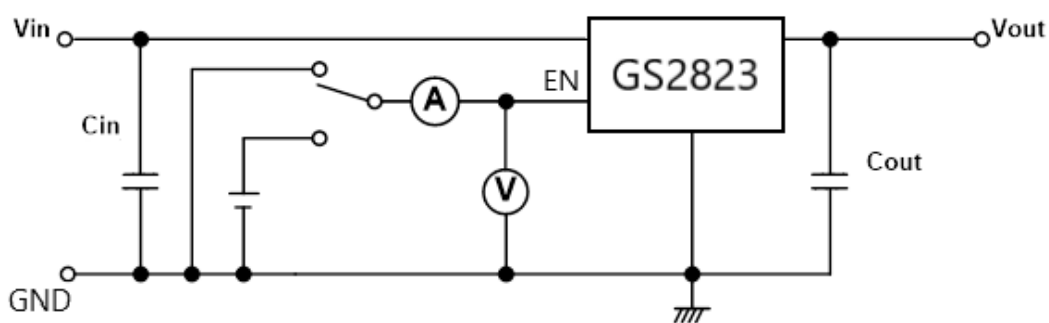
Test Circuit

Operating Function Test



C_{IN} : $1\mu F$ or more. C_{OUT} : $1\mu F$ or more

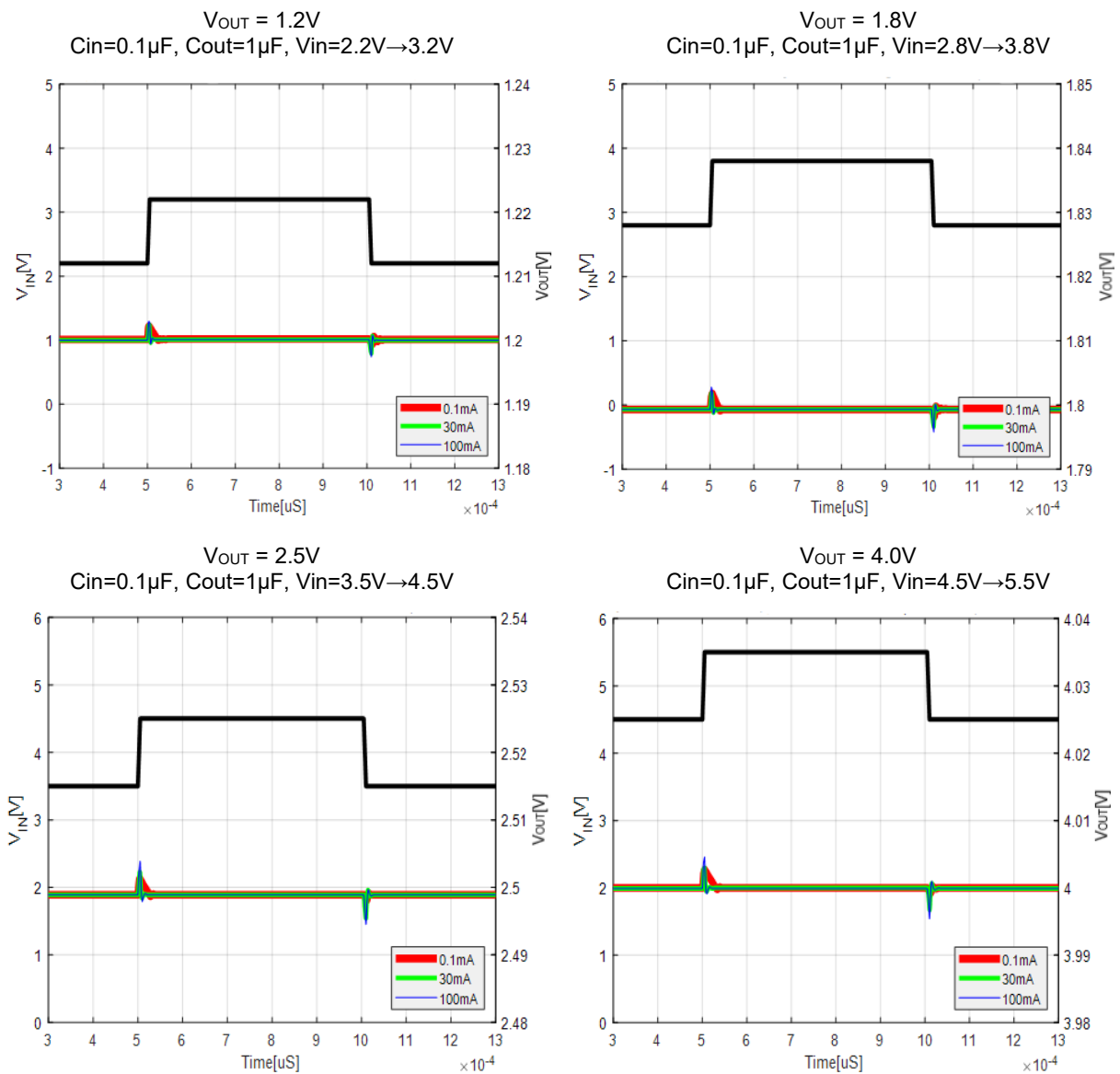
Enable Function Test



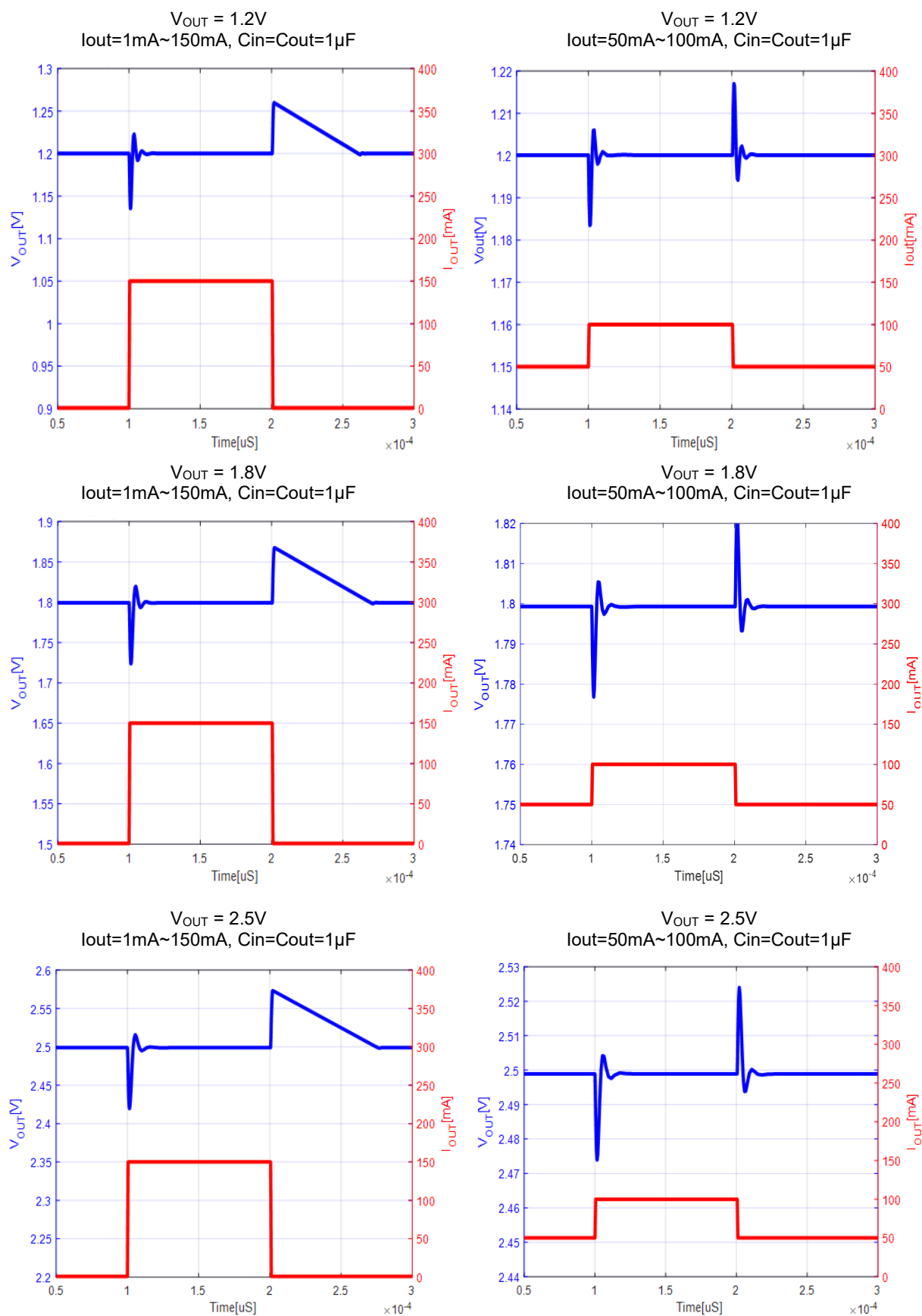
C_{IN} : $1\mu F$ or more. C_{OUT} : $1\mu F$ or more

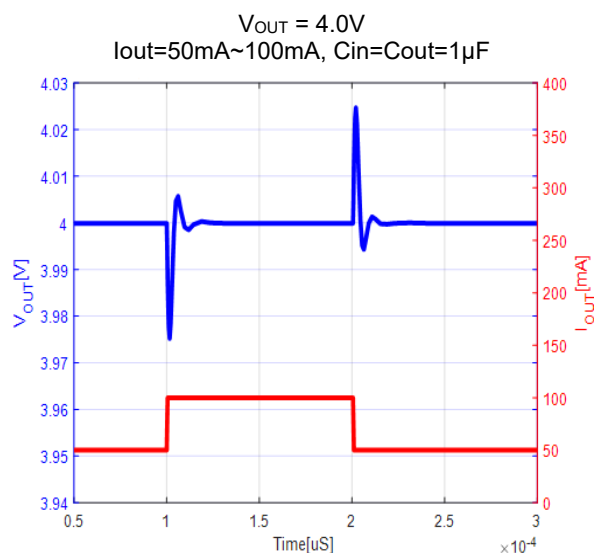
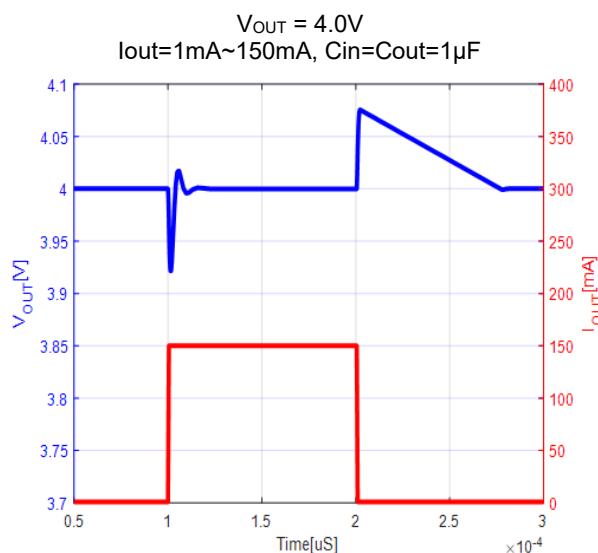
Typical Performance Characteristics

Line Transient Response Characteristics

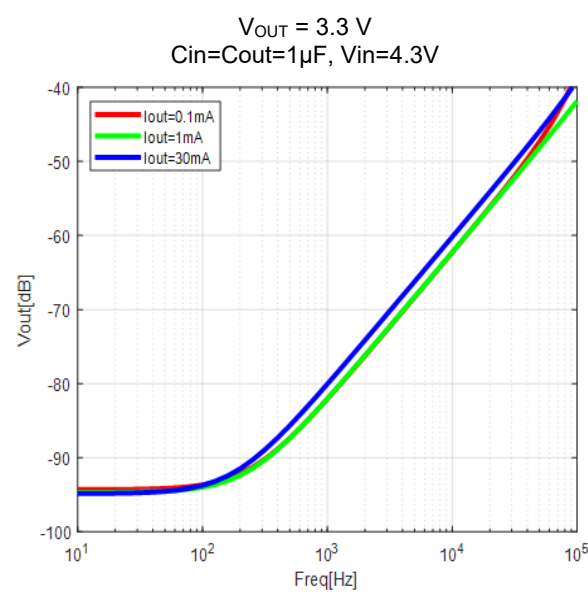
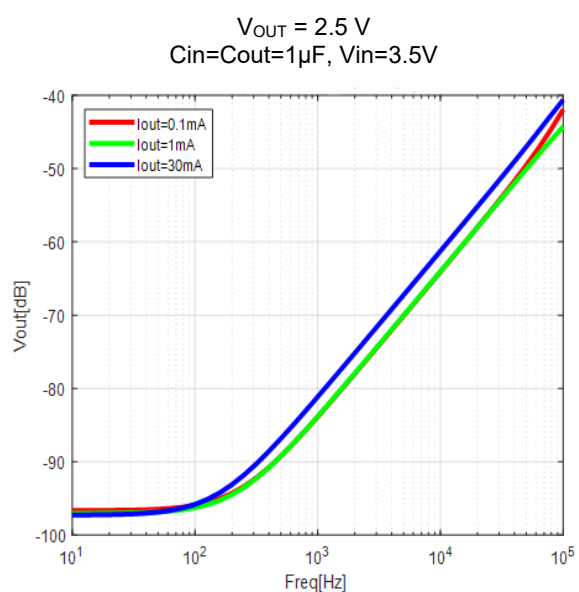
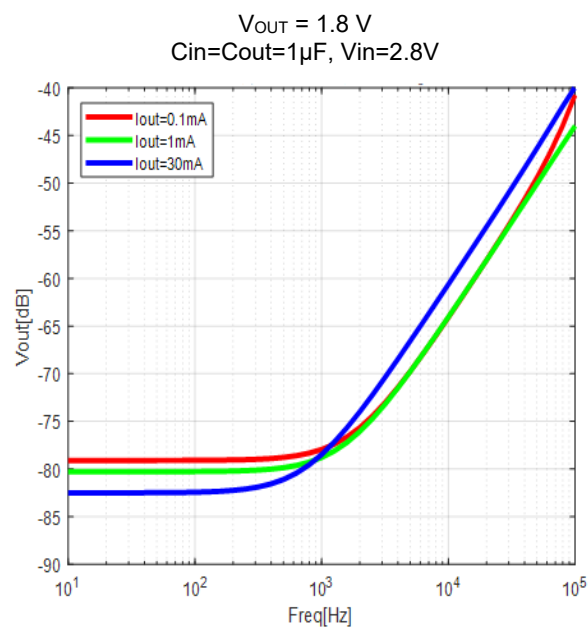
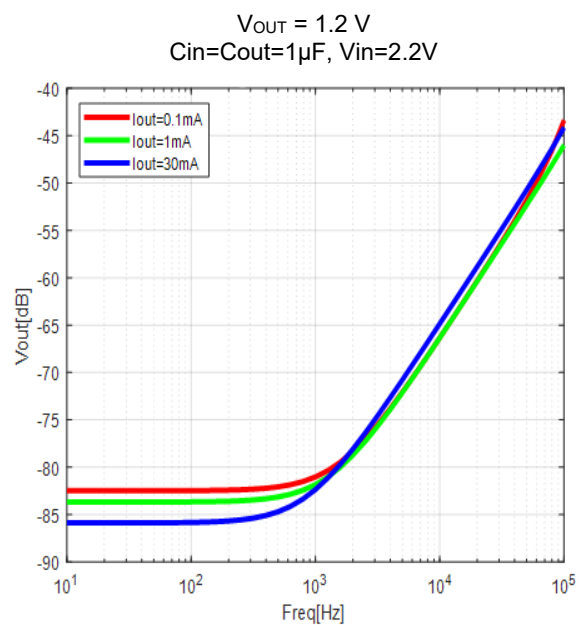


Load Transient Response Characteristics

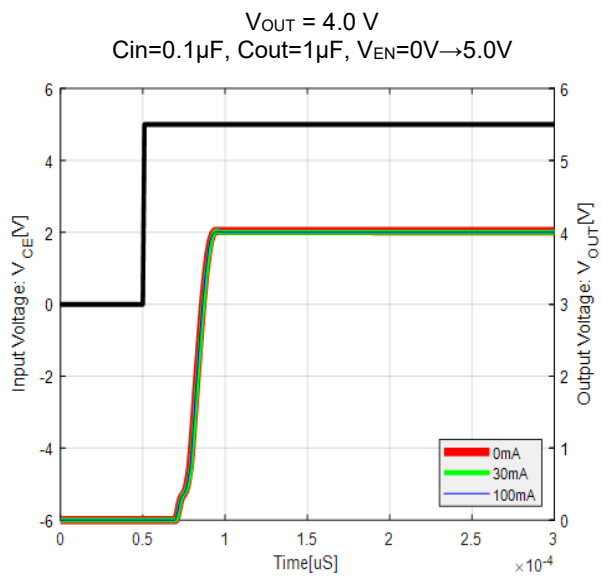
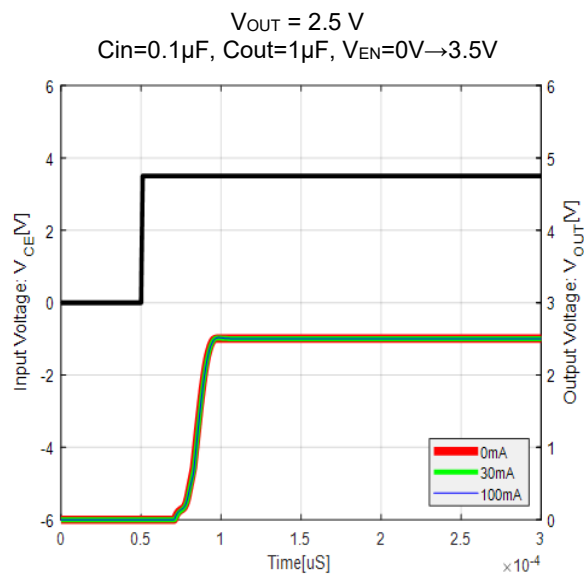
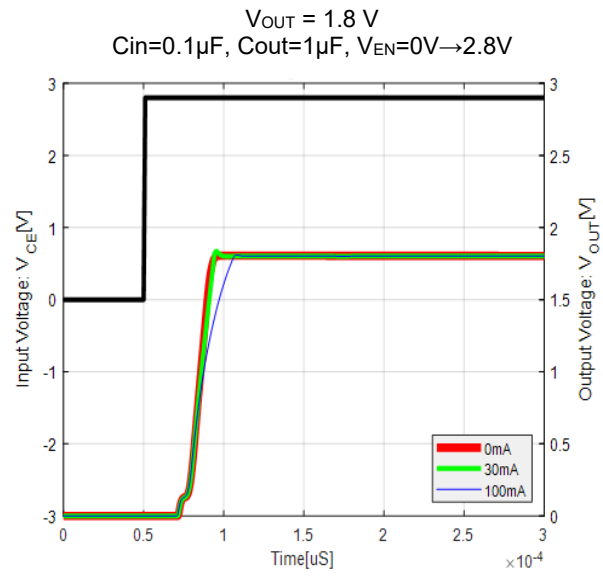
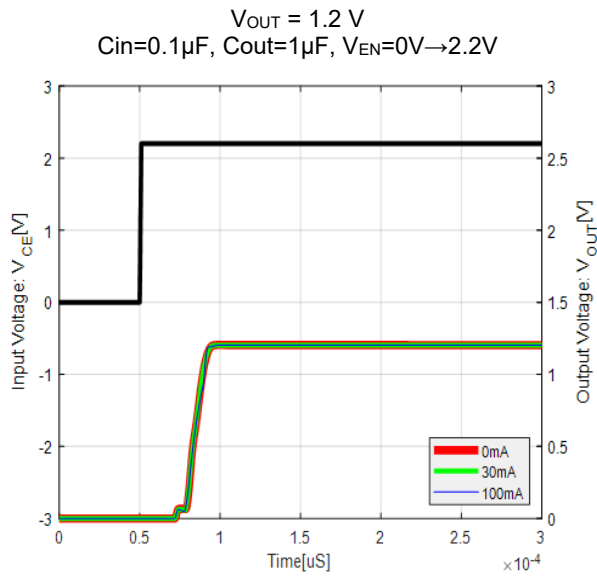




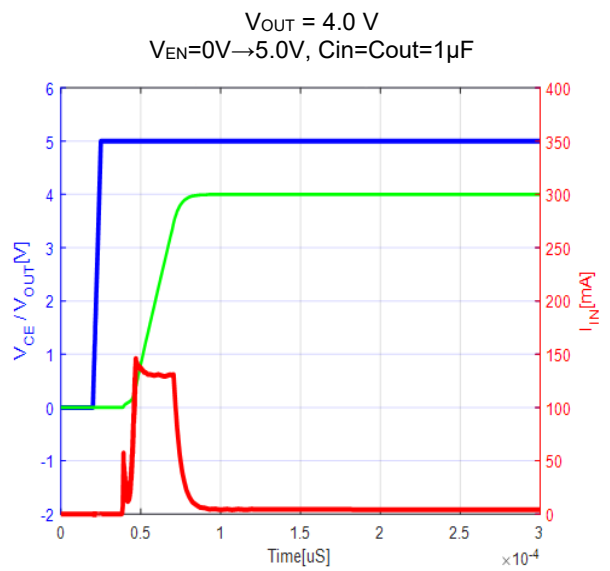
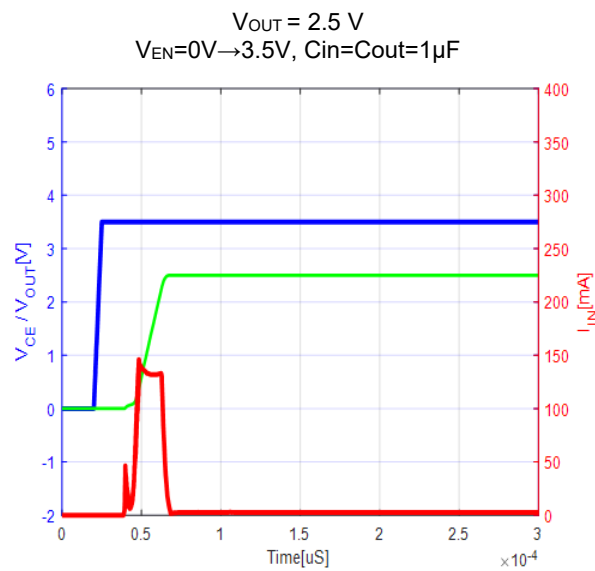
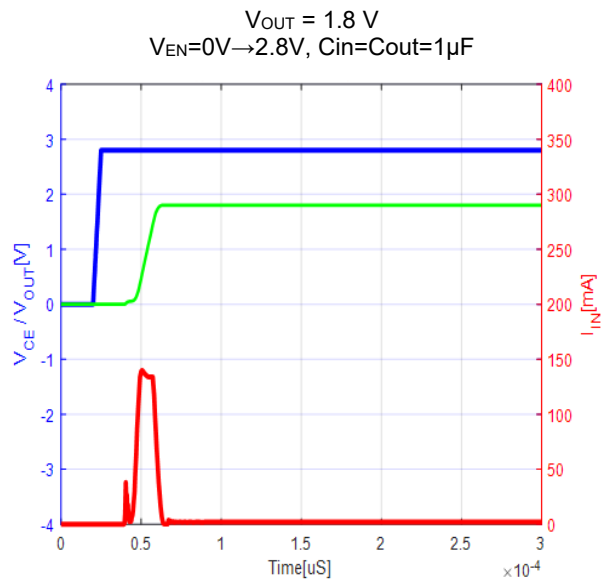
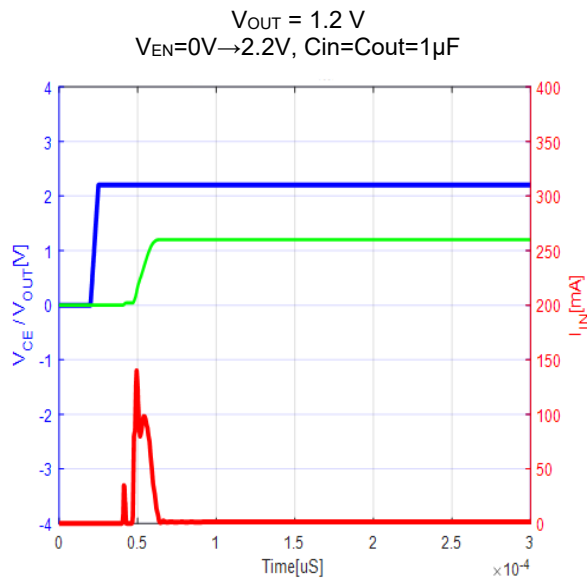
Ripple Rejection



EN Pin Rising Response Characteristics

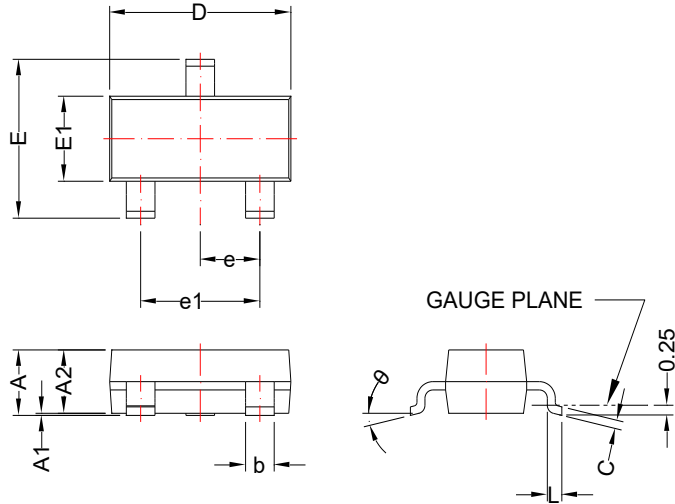


Inrush Current Response Time

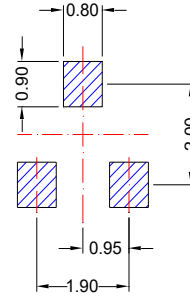


SOT-23

Package Dimension



Recommended Land Pattern



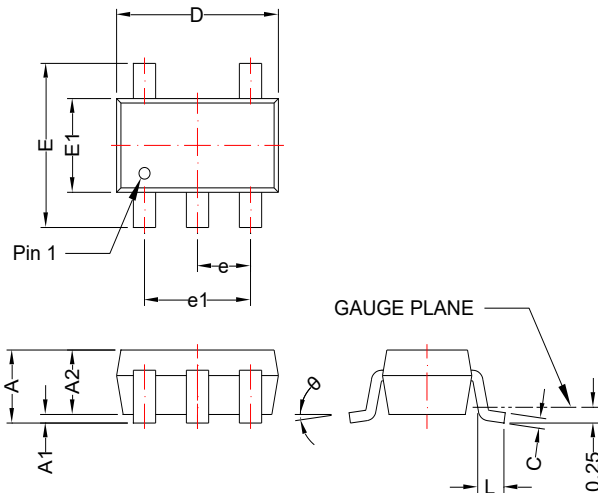
Dimensions				
Symbol	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	0.75	1.17	0.030	0.046
A1	0.01	0.15	0.000	0.006
A2	0.70	1.02	0.028	0.040
b	0.30	0.50	0.012	0.020
c	0.08	0.20	0.003	0.008
D	2.80	3.04	0.110	0.120
E	2.10	2.64	0.083	0.104
E1	1.20	1.40	0.047	0.055
e	0.95 BSC		0.037 BSC	
e1	1.90 BSC		0.075 BSC	
L	0.30	0.60	0.012	0.024
θ	0°	8°	0°	8°

NOTE:

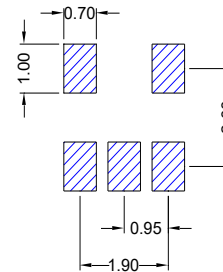
Dimensions are exclusive of Burrs, Mold Flash and Tie Bar extrusions.

SOT-23-5L

Package Dimension



Recommended Land Pattern



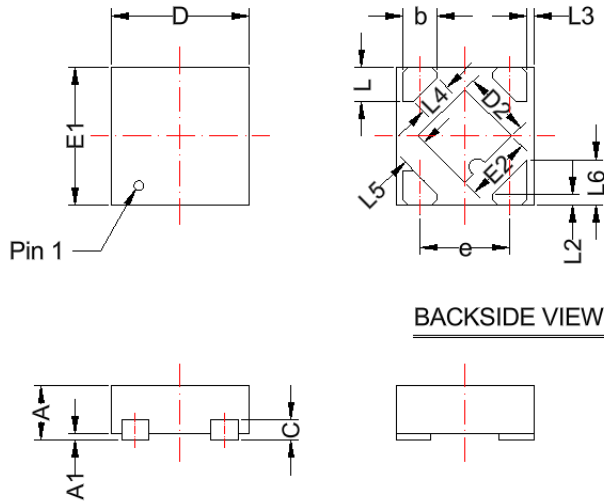
Dimensions				
Symbol	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	0.90	1.45	0.035	0.057
A1	0.00	0.15	0.000	0.006
A2	0.90	1.30	0.035	0.051
b	0.30	0.50	0.012	0.020
c	0.08	0.26	0.003	0.010
D	2.70	3.10	0.106	0.122
E	2.20	3.00	0.087	0.118
E1	1.30	1.75	0.051	0.069
e	0.95 BSC		0.037 BSC	
e1	1.90 BSC		0.075 BSC	
L	0.30	0.60	0.012	0.024
θ	0°	8°	0°	8°

NOTE:

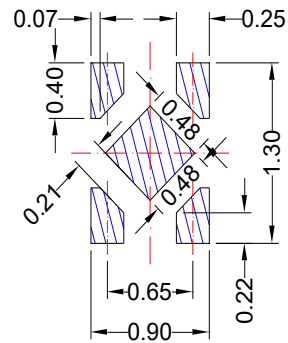
Dimensions are exclusive of Burrs, Mold Flash and Tie Bar extrusions.

DFN1x1-4L

Package Dimension



Recommended Land Pattern



Unit:mm

Dimensions				
Symbol	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	0.35	0.40	0.014	0.016
A1	0.00	0.05	0.000	0.002
b	0.20	0.30	0.008	0.012
c	0.127 REF		0.005 REF	
D	0.95	1.05	0.037	0.041
D2	0.43	0.53	0.017	0.021
E1	0.95	1.05	0.037	0.041
E2	0.43	0.53	0.017	0.021
E	0.65 BSC		0.026 BSC	
L	0.20	0.30	0.008	0.012
L2	0.078 REF		0.003 REF	
L3	0.050 REF		0.002 REF	
L4	0.243 REF		0.010 REF	
L5	0.200 REF		0.008 REF	
L6	0.328 REF		0.013 REF	

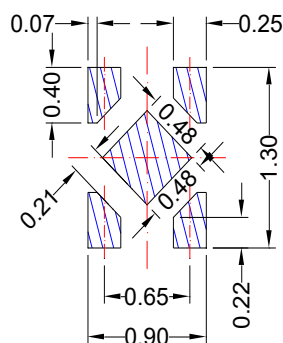
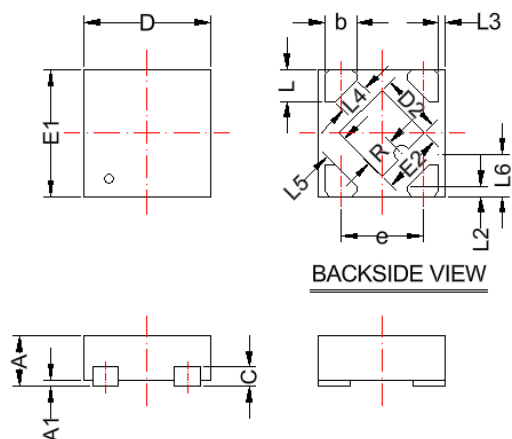
NOTE:

Dimensions are exclusive of Burrs, Mold Flash and Tie Bar extrusions.

DFN1x1-4L(A)

Package Dimension

Recommended Land Pattern



Unit:mm

Dimensions				
Symbol	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	0.35	0.40	0.014	0.016
A1	0.00	0.05	0.000	0.002
b	0.20	0.30	0.008	0.012
c	0.127 REF		0.005 REF	
D	0.95	1.05	0.037	0.041
D2	0.43	0.53	0.017	0.021
E1	0.95	1.05	0.037	0.041
E2	0.43	0.53	0.017	0.021
E	0.65 BSC		0.026 BSC	
R	0.02	0.08	0.001	0.003
L	0.20	0.30	0.008	0.012
L2	0.078 REF		0.003 REF	
L3	0.050 REF		0.002 REF	
L4	0.243 REF		0.010 REF	
L5	0.200 REF		0.008 REF	
L6	0.328 REF		0.013 REF	

NOTE:

Dimensions are exclusive of Burrs, Mold Flash and Tie Bar extrusions.

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