

GS2823

300mA High PSRR Low Dropout Voltage Linear Regulators

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 fixed output voltage type. It has 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. These ICs perform with low dropout voltage and a chip enable function DFN1x1-4L SOT-23, SOT-23-5L and package only.

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.

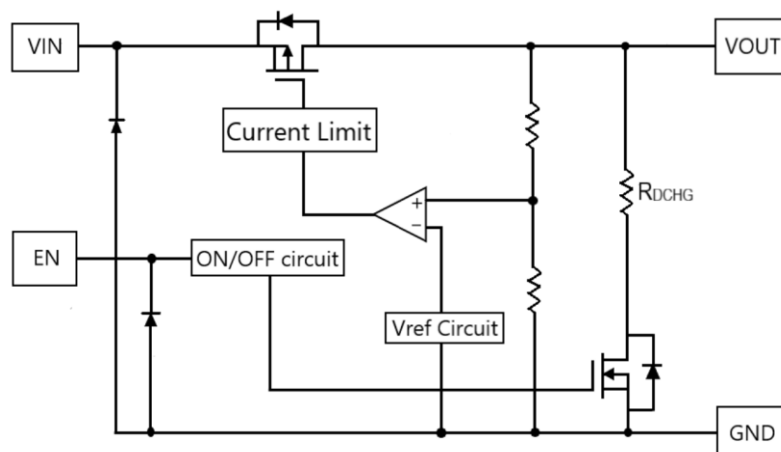
Features

- Input Voltage Range: 1.6V to 5.5V
- Low Dropout Voltage: 0.2V at 300mA (Typ) (Vout=3V)
- Output Current: 300mA
- High Ripple Rejection: 80dB (Typ) (f=1kHz)
- Output Voltage: Vout≥2V (Accuracy ±1.0%)
Vout<2V (Accuracy ±20mV)
- Low Supply Current: 150μA (Typ)
- Standby Current: 0.1μA (Typ)
- EN Function: Active High
- Operating Ambient Temperature: -40~+85°C
- Current Limit and Short Circuit Protection
- Fixed Output Voltage: 1.2V to 4.0V
- Low ESR Capacitors: Cin=1μF, CL=1μF
- Miniature Packages: SOT-23, SOT-23-5L, and DFN1x1-4L
- RoHS Compliant, 100%Pb & Halogen Free

Applications

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

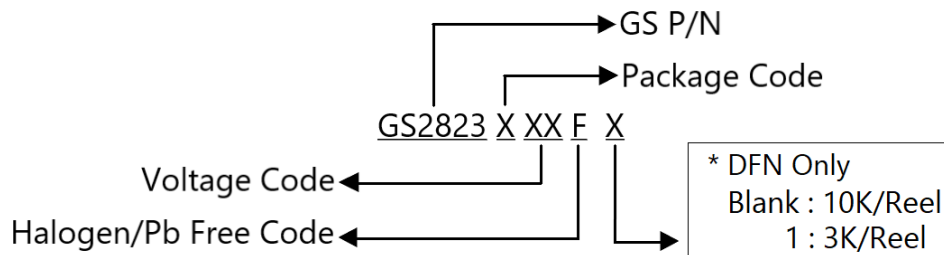
Block Diagram



Packages & Pin Assignments

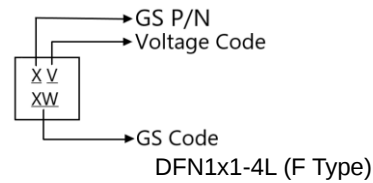
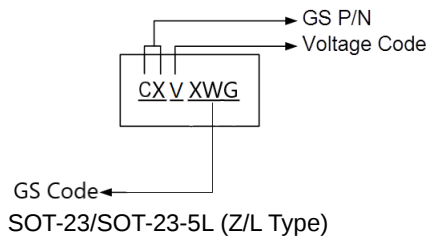
SOT-23	SOT-23-5L	DFN1X1-4L
Pin Name	Function	
NC	No Connect.	
EN	Enable Input. Pulling this pin below 0.3V turn the regulator off, reducing the quiescent current to a fraction of its operating value. The device will be enabled if this pin is left open. Connect to V_{IN} if not being used.	
GND	Ground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

Ordering Information



SOT-23	SOT-23-5L	DFN1x1-4L	Output Voltage
GS2823Z12F	GS2823L12F	GS2823F12F GS2823F12F1	1.2V
GS2823Z15F	GS2823L15F	GS2823F15F GS2823F15F1	1.5V
GS2823Z18F	GS2823L18F	GS2823F18F GS2823F18F1	1.8V
GS2823Z25F	GS2823L25F	GS2823F25F GS2823F25F1	2.5V
GS2823Z28F	GS2823L28F	GS2823F28F GS2823F28F1	2.8V
GS2823Z29F	GS2823L29F	GS2823F29F GS2823F29F1	2.9V
GS2823Z33F	GS2823L33F	GS2823F33F GS2823F33F1	3.3V
GS2823Z40F	GS2823L40F	GS2823F40F GS2823F40F1	4.0V

Marking Information



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

Absolute Maximum Ratings

(T_A=25°C unless otherwise specified)

Symbol	Parameter		Max	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	Power Dissipation	SOT-23-5L	600	mW
		SOT-23	560	
		DFN1x1-4L	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
θ _{JA}	Thermal Resistance Junction to	SOT-23-5L	166	°C/W

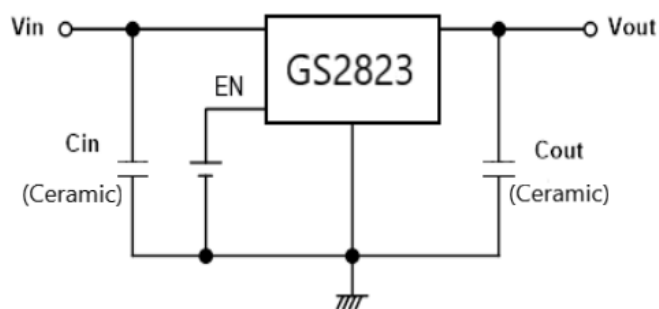
	Ambient	SOT-23	179	
		DFN1x1-4L	294	

Electrical Characteristics

(Unless otherwise specified $V_{IN}=V_{OUT}+1V$, $T_A=25^{\circ}C$)

Symbol	Parameter	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}	$V_{OUT}+0.02$	V
			$V_{OUT} \geq 2V$	$V_{OUT} \times 0.99$	V_{OUT}	$V_{OUT} \times 1.01$	
I_{OUTMAX}	Max Output Current	$V_{IN} \geq V_{OUT}+1.0V$	$1.2V \leq V_{OUT} \leq 4.0V$	300	-	-	mA
ΔV_{LINE}	Line regulation	$V_{OUT}+0.5V \leq V_{IN} \leq 5.5V$ $I_{OUT} = 50mA$	$1.2V \leq V_{OUT} \leq 4.0V$	-	0.01	0.1	%/V
ΔV_{LOAD}	Load Regulation	$V_{IN}=V_{OUT}+1V$ $0.1mA \leq I_{OUT} \leq 300mA$	$1.2V \leq V_{OUT} \leq 4.0V$	-	25	45	mV
V_{DROP}	Dropout Voltage	$I_{OUT} = 300mA$	$1.2V \leq V_{OUT} < 1.3V$	-	0.48	0.63	V
			$1.3V \leq V_{OUT} < 1.4V$	-	0.44	0.58	
			$1.4V \leq V_{OUT} < 1.5V$	-	0.42	0.52	
			$1.5V \leq V_{OUT} < 1.6V$	-	0.42	0.46	
			$1.6V \leq V_{OUT} < 1.8V$	-	0.40	0.44	
			$1.8V \leq V_{OUT} < 2.0V$	-	0.30	0.41	
			$2.0V \leq V_{OUT} < 2.5V$	-	0.27	0.38	
			$2.5V \leq V_{OUT} < 3.0V$	-	0.24	0.35	
			$3.0V < V_{OUT} \leq 4.0V$	-	0.20	0.31	
$\Delta V_{OUT}/\Delta T$	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

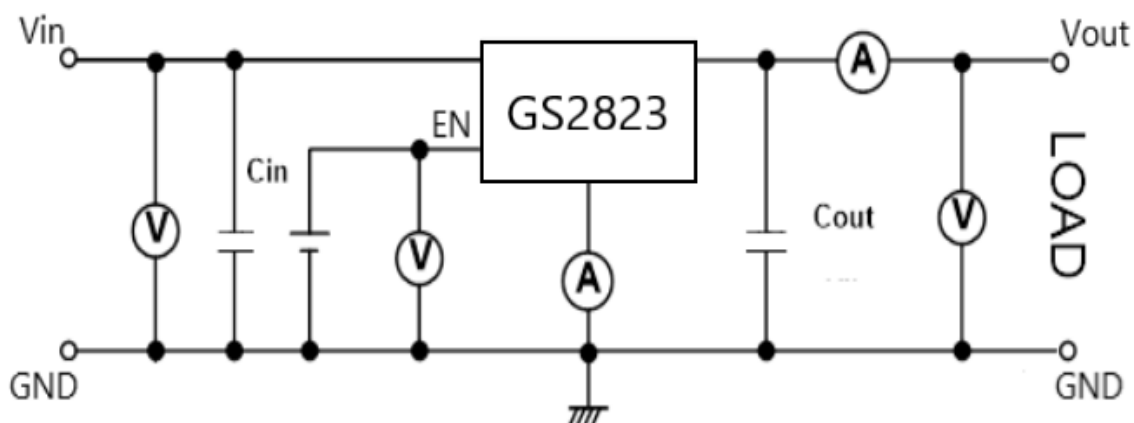
Typical Applications



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

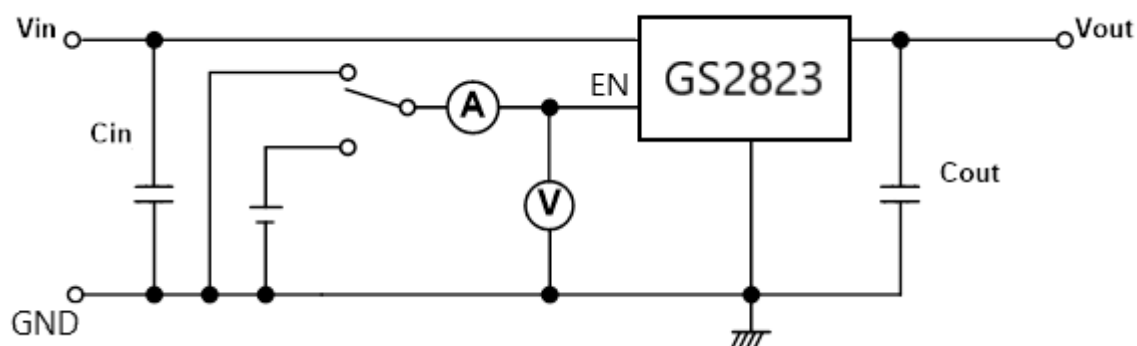
Test Circuit

Operating Function Test



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

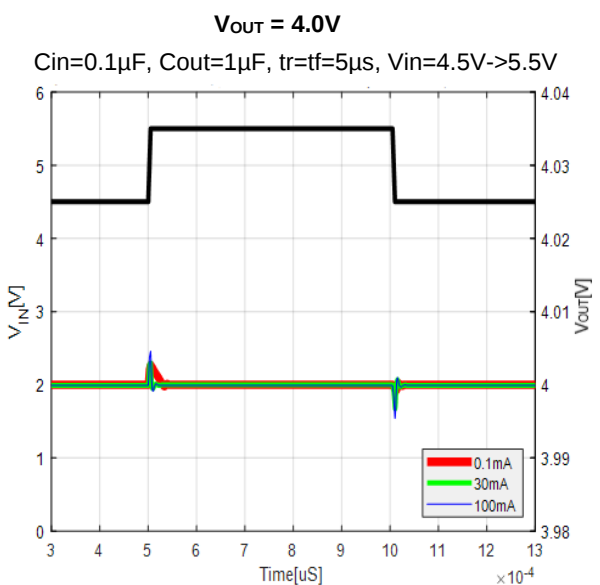
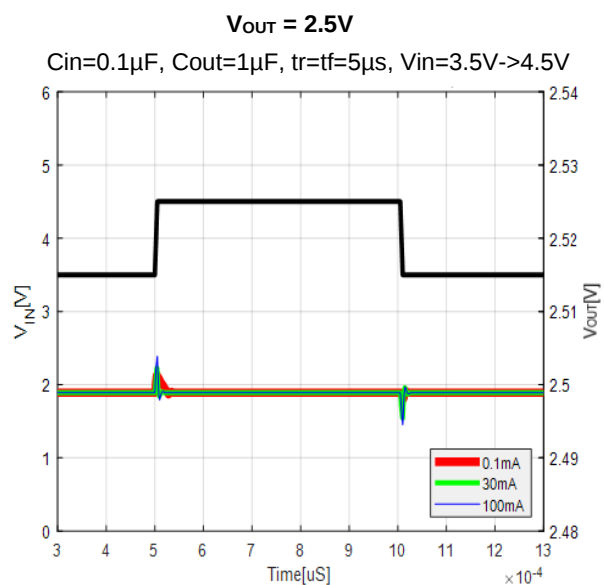
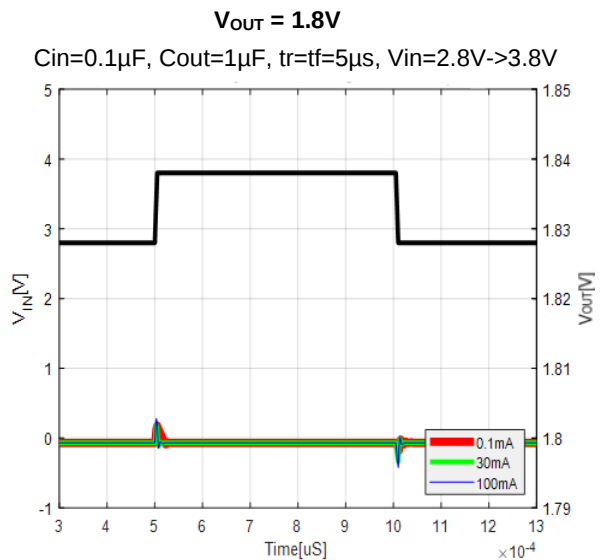
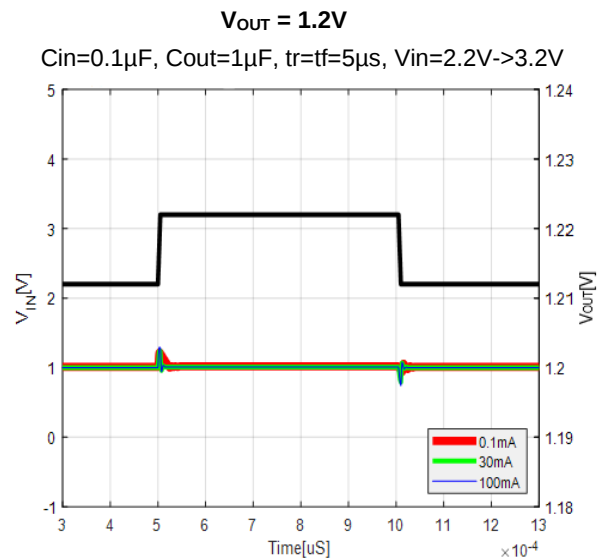
Enable Function Test



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

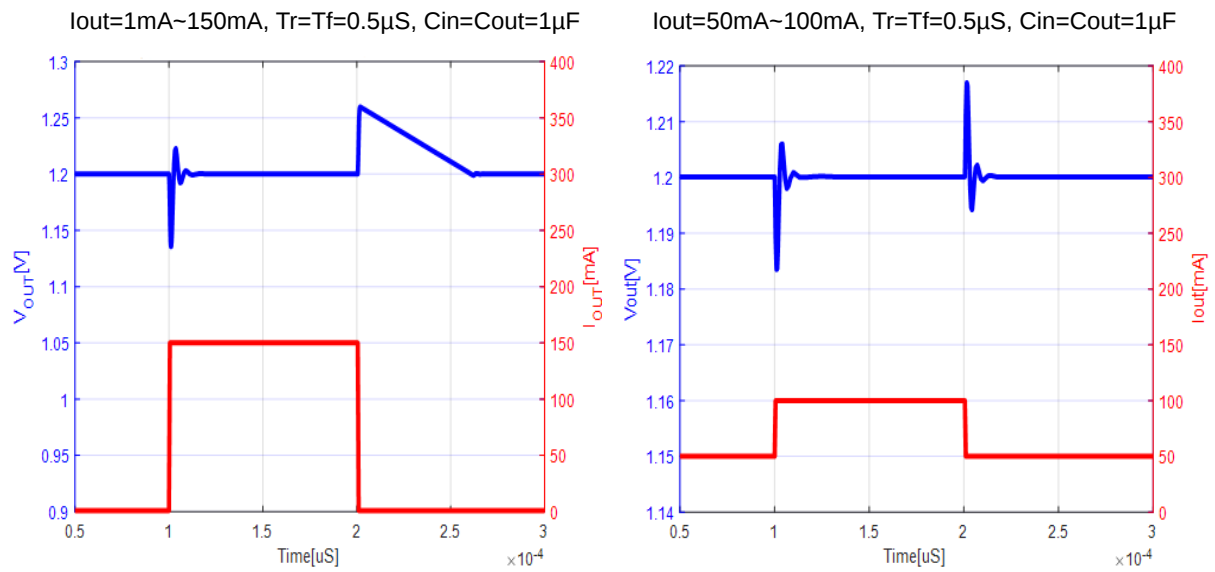
Typical Performance Characteristics

Line Transient response characteristics ($T_A=25^\circ\text{C}$)

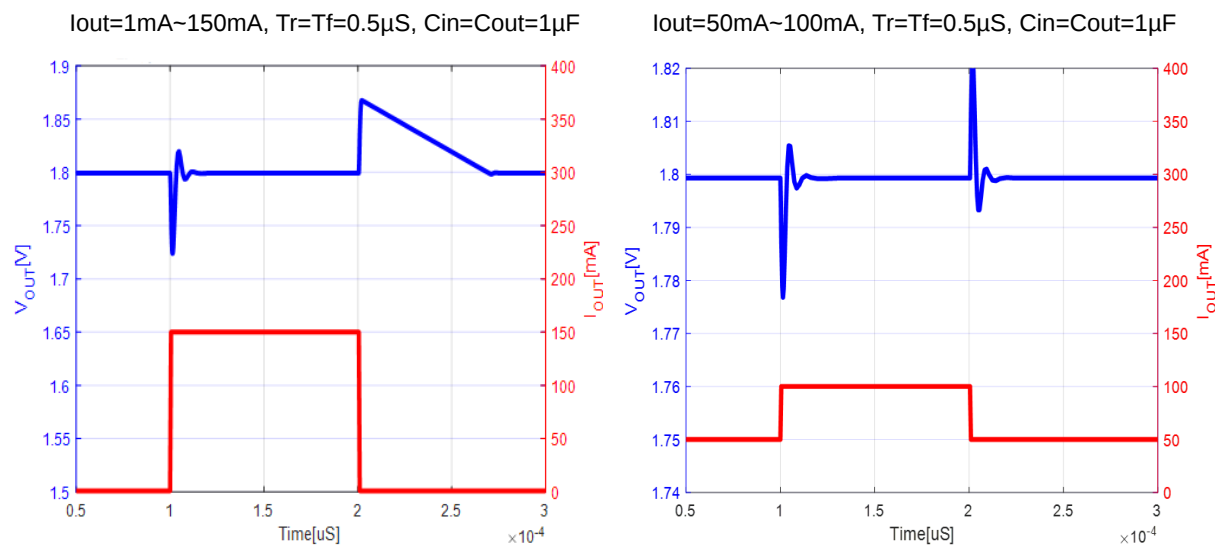


Load Transient response characteristics (T_A=25°C)

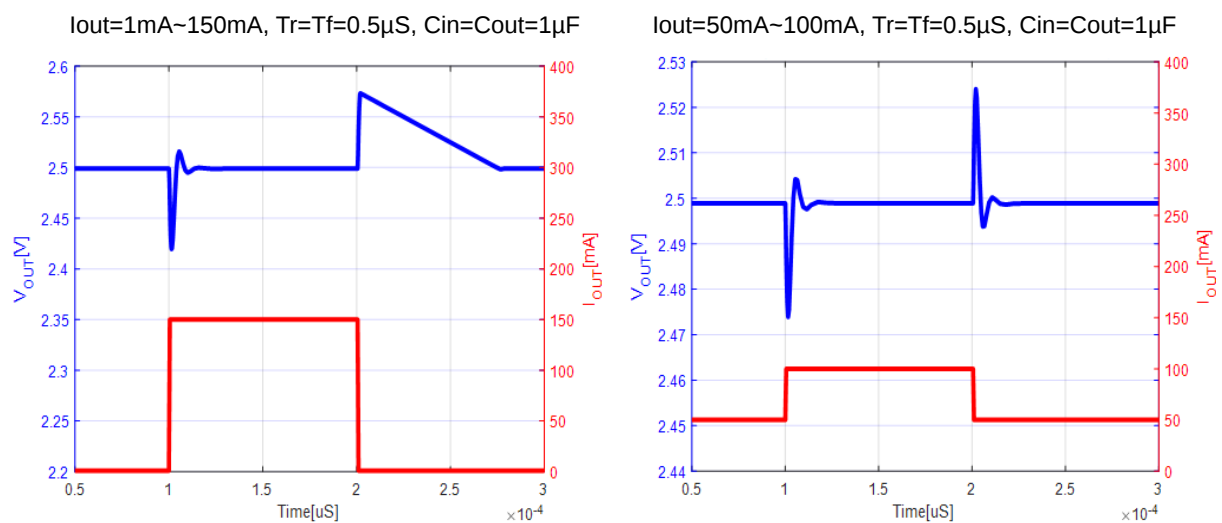
V_{OUT} = 1.2V



V_{OUT} = 1.8V

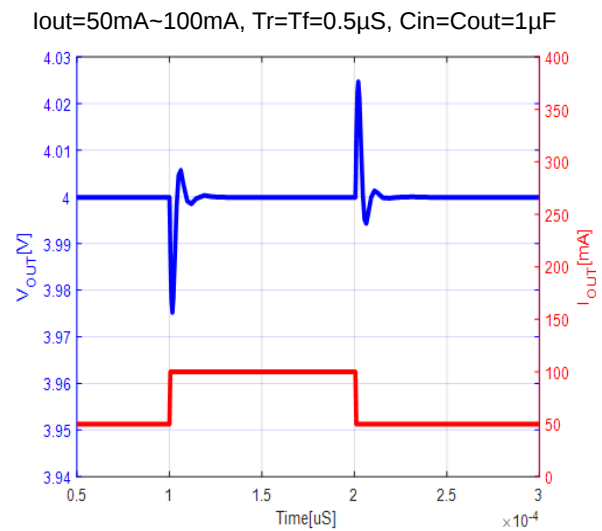
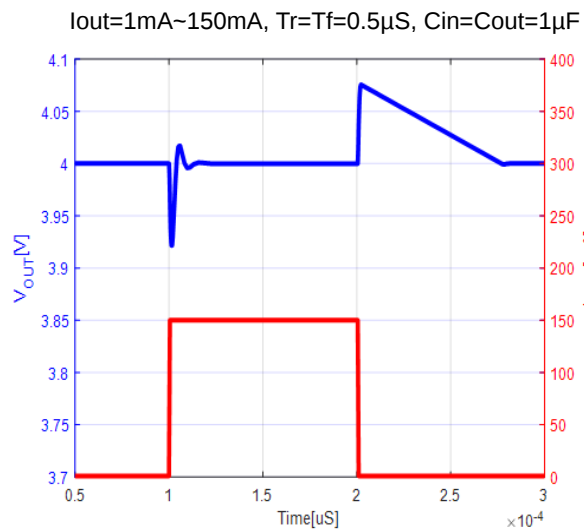


V_{OUT} = 2.5V

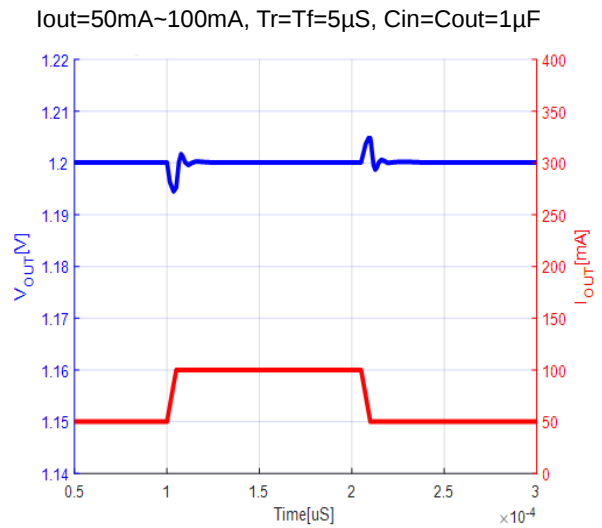
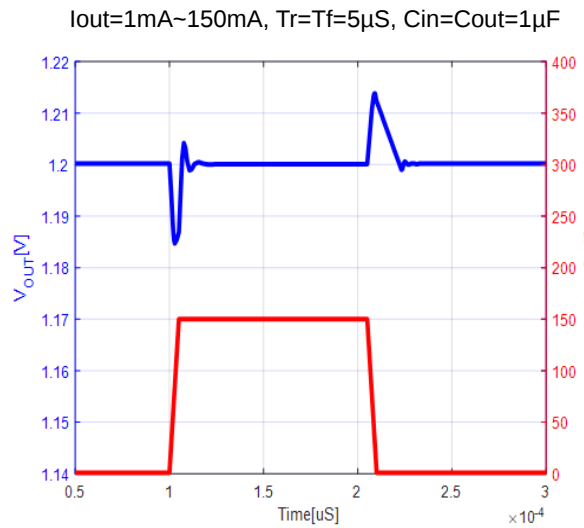


Load Transient response characteristics (T_A=25°C)

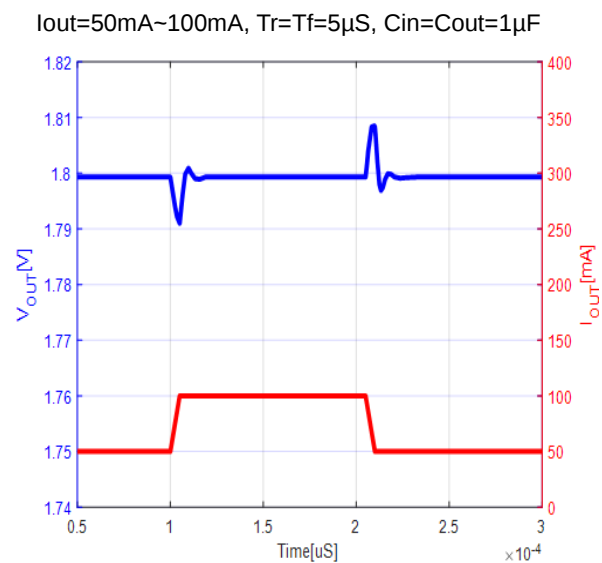
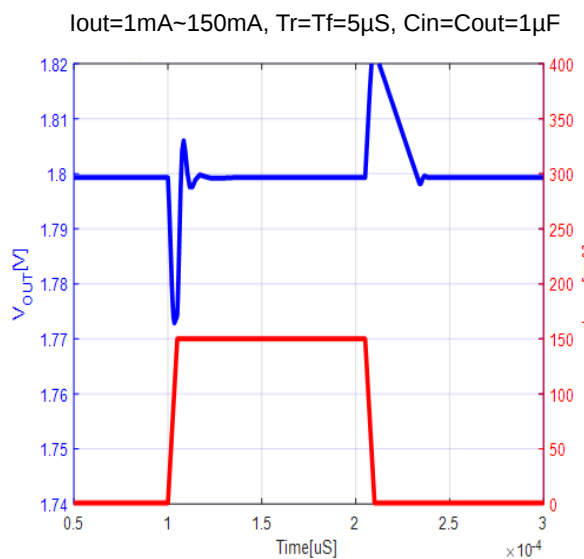
V_{OUT} = 4.0V



V_{OUT} = 1.2V

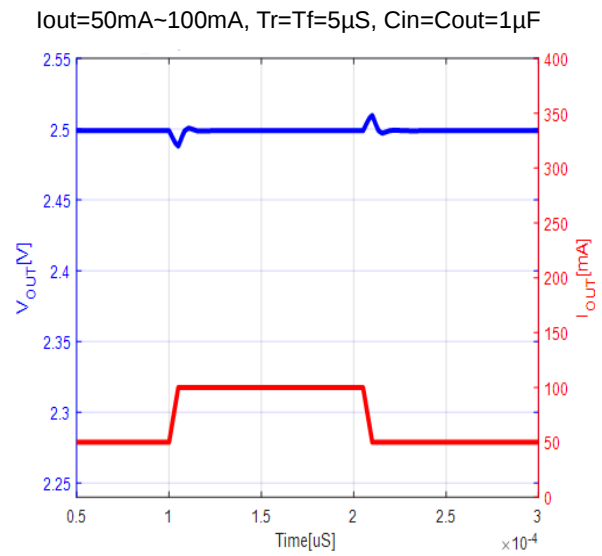
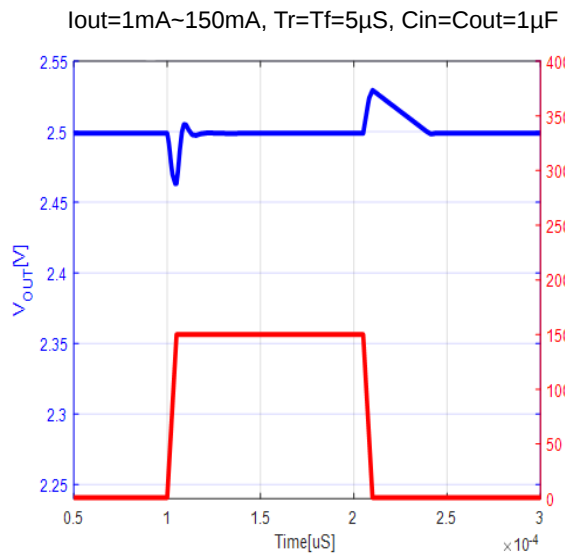


V_{OUT} = 1.8V

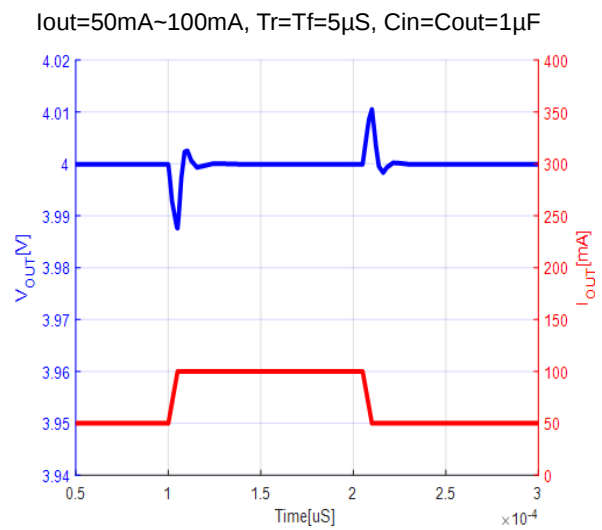
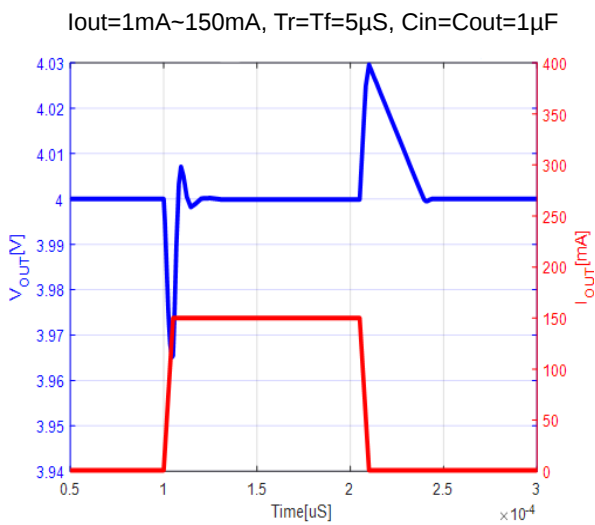


Load Transient response characteristics ($T_A=25^\circ\text{C}$)

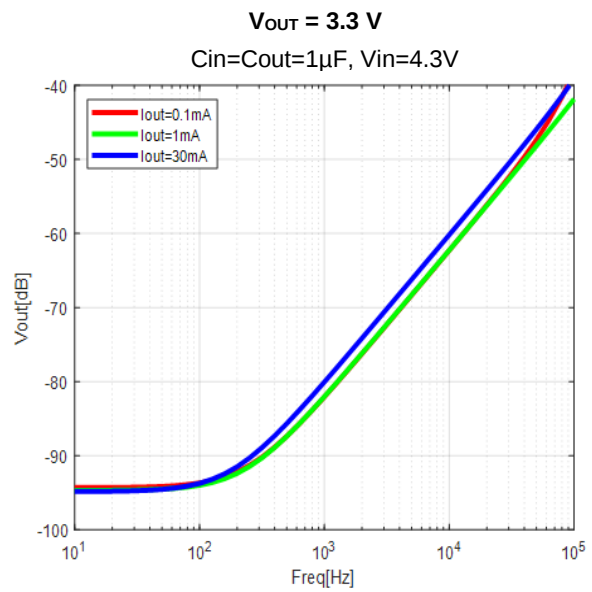
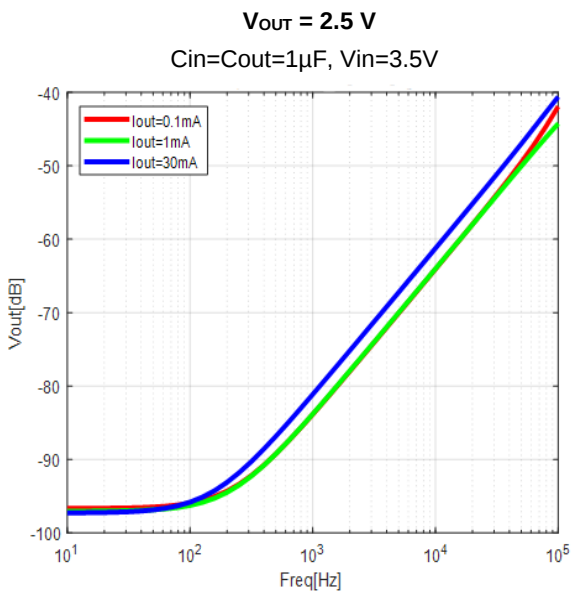
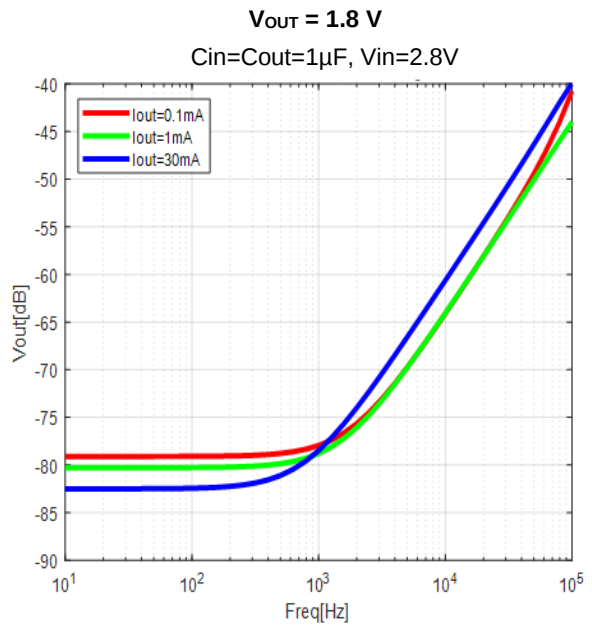
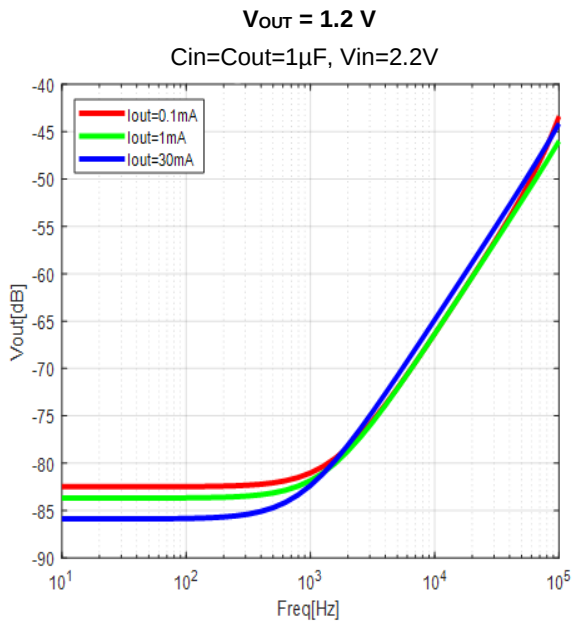
$V_{OUT} = 2.5\text{V}$



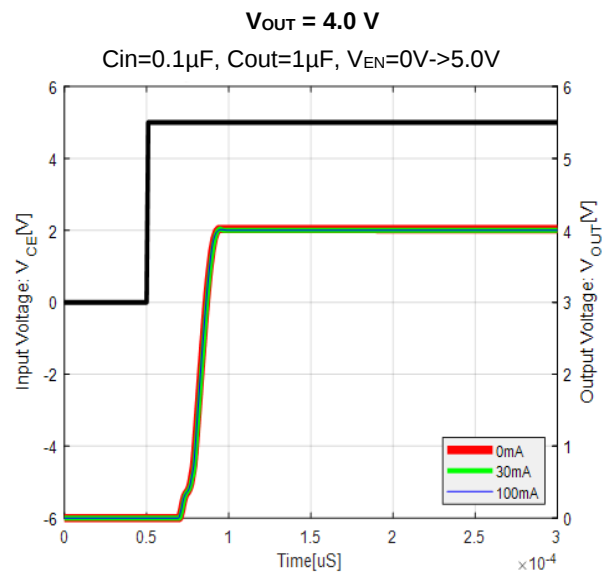
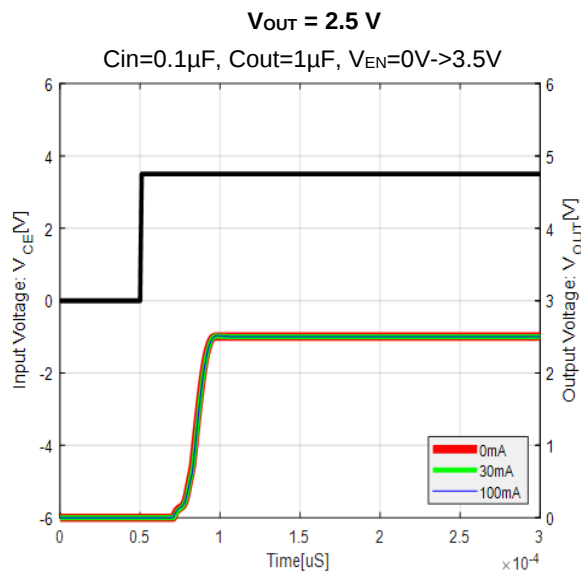
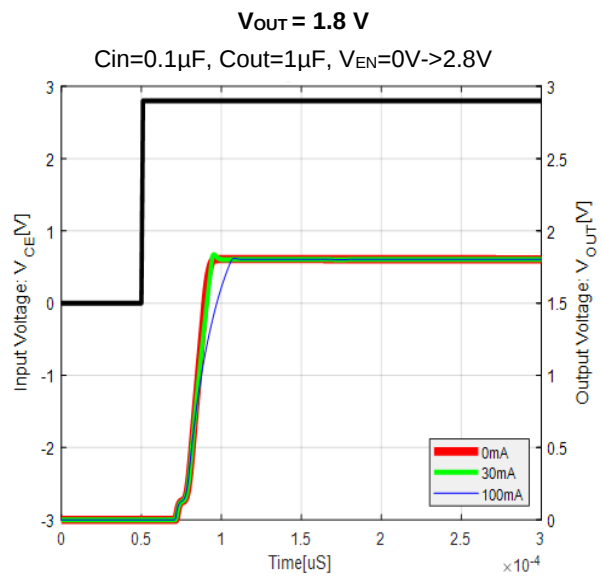
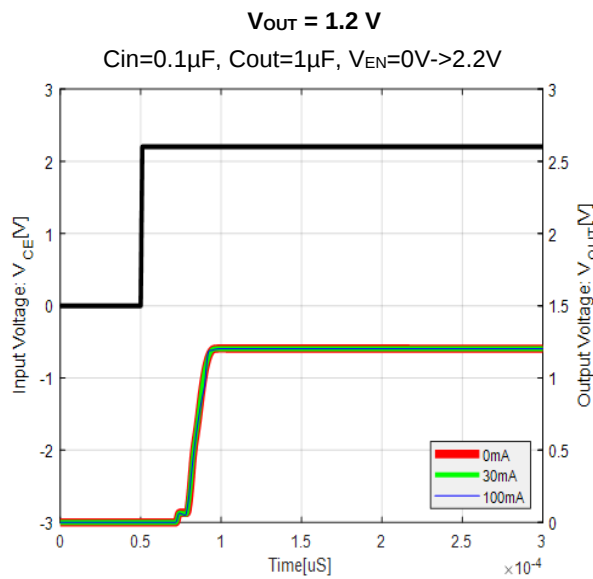
$V_{OUT} = 4.0\text{V}$



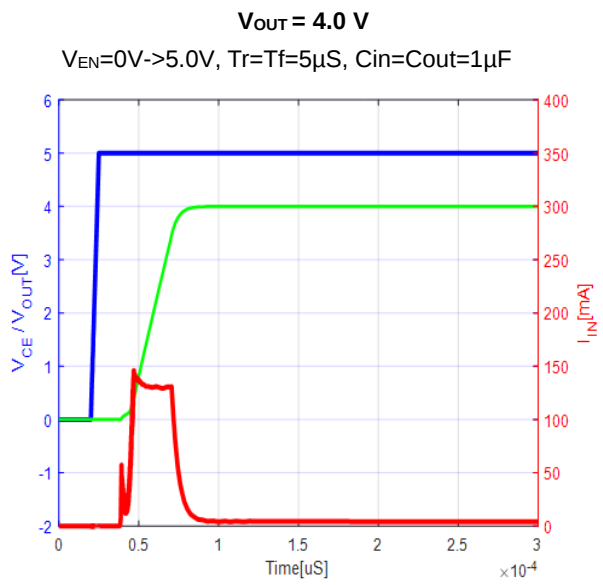
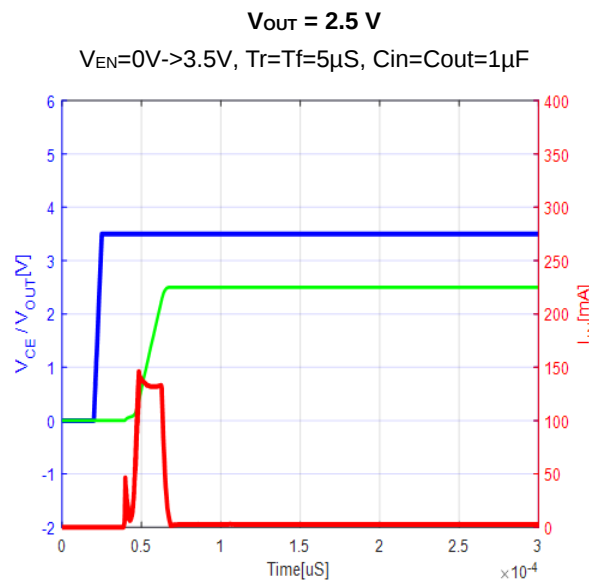
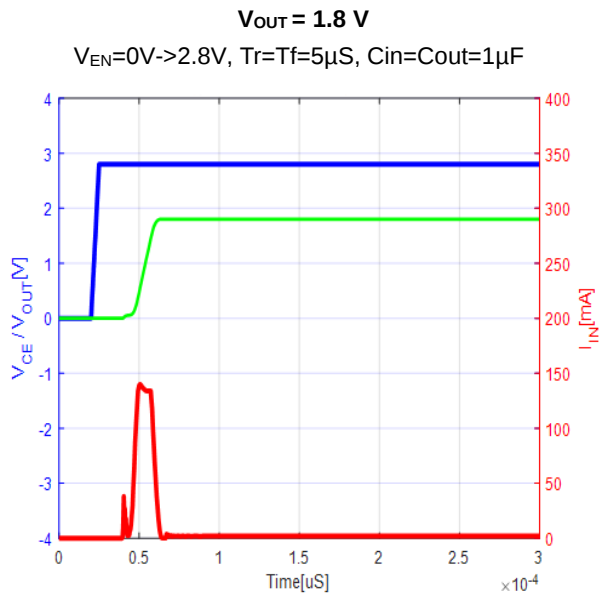
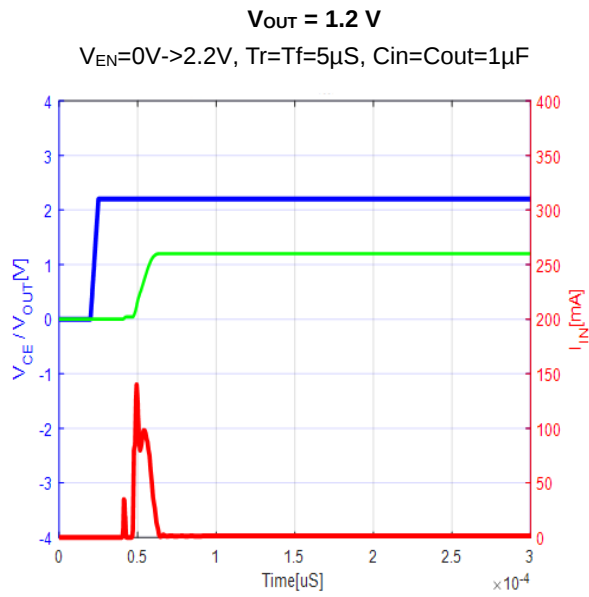
Ripple rejection (T_A=25°C)



EN Pin rising response characteristics ($T_A=25^\circ\text{C}$)

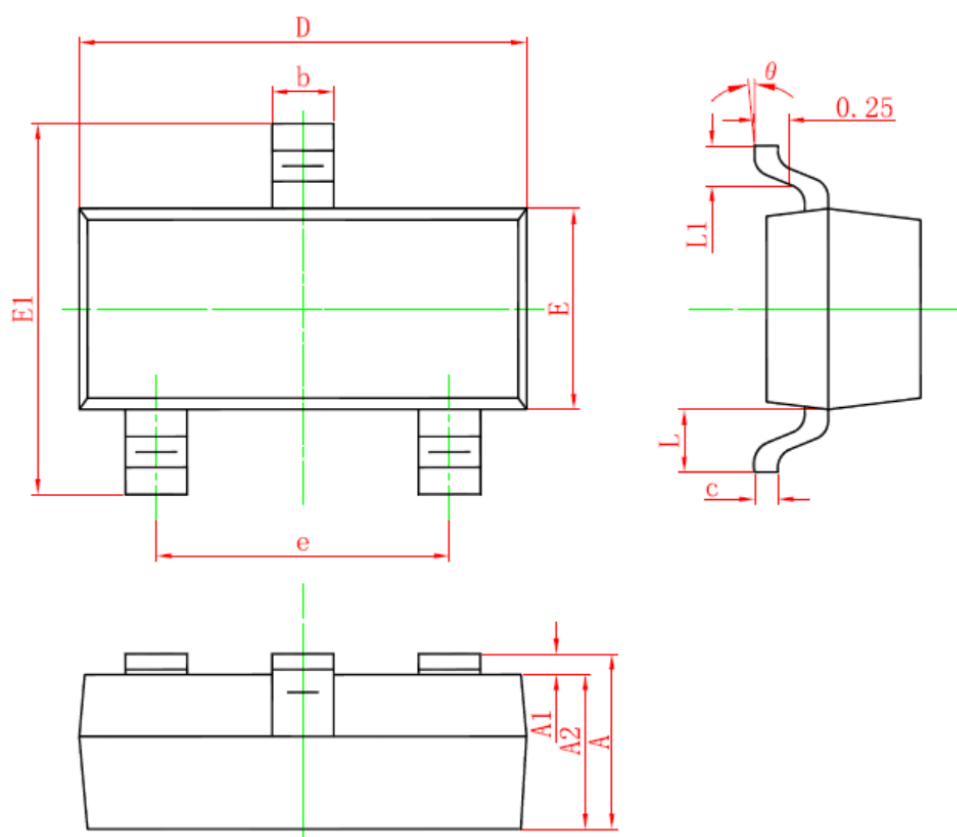


Inrush Current Response Time($T_A=25^{\circ}\text{C}$)



Package Dimension

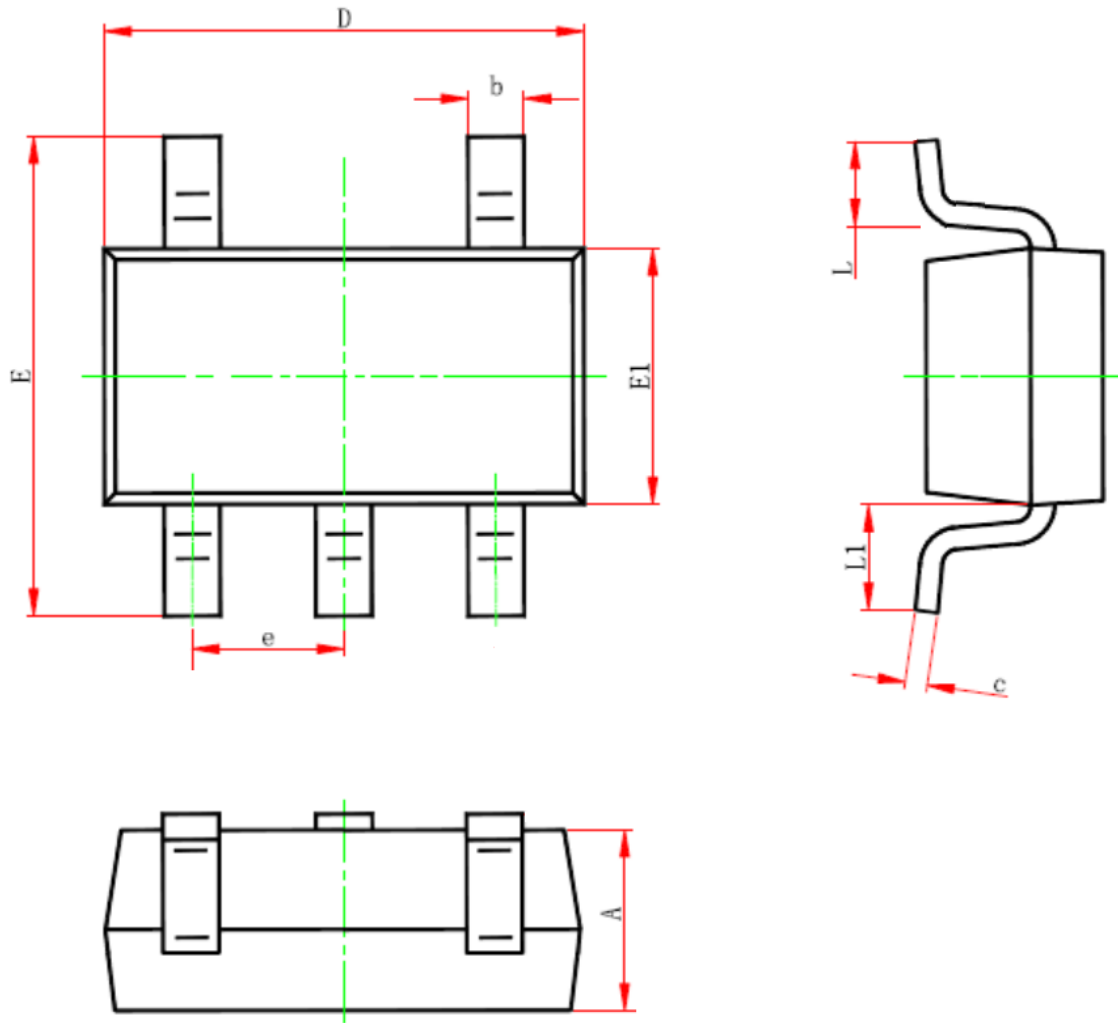
SOT-23



Dimensions

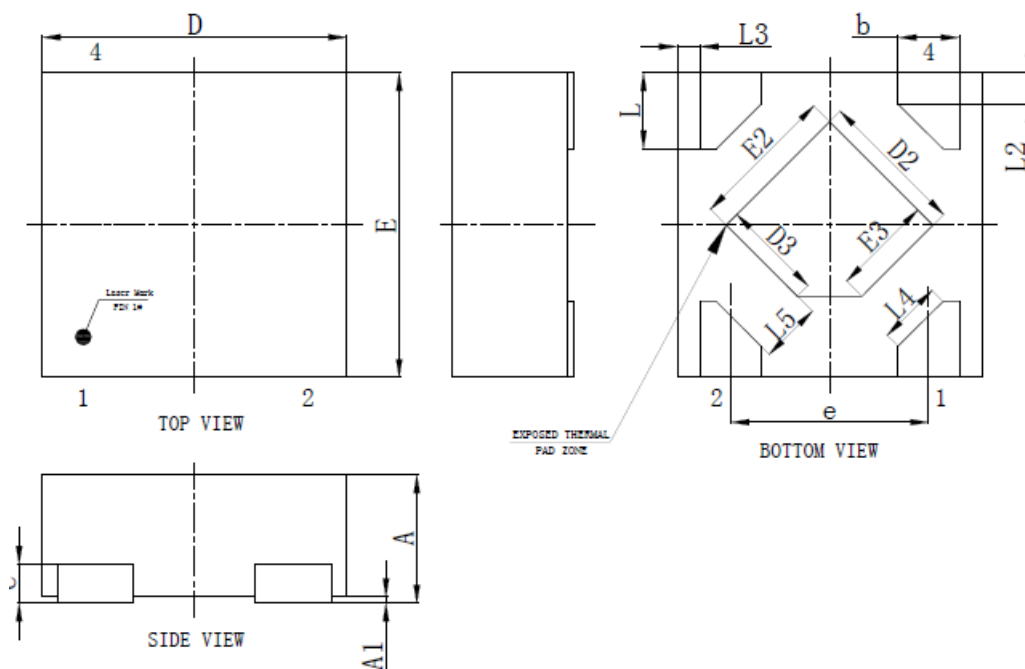
SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	0.75	1.15	0.030	0.045
A1	0.00	0.10	0.000	0.004
A2	0.90	1.10	0.035	0.043
b	0.30	0.50	0.012	0.020
c	0.13	0.20	0.005	0.008
D	2.80	3.00	0.110	0.118
E	1.20	1.40	0.047	0.055
E1	2.25	2.55	0.089	0.100
e	1.90 (TYP)		0.075 (TYP)	
L	0.55 (TYP)		0.022 (TYP)	
L1	0.30	0.50	0.012	0.020
θ	0°	8°	0°	8°

SOT-23-5L



Dimensions				
SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	1.05	1.25	0.041	0.049
b	0.30	0.50	0.012	0.020
c	0.10	0.20	0.004	0.008
D	2.82	3.02	0.111	0.119
E	2.80	3.10	0.110	0.122
E1	1.50	1.70	0.059	0.067
e	0.95 (TYP)		0.037 (TYP)	
L	0.30	0.60	0.012	0.024
L1	0.65 (TYP)		0.026 (TYP)	

DFN1x1-4L



Dimensions

SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	0.350	0.400	0.014	0.016
A1	0.000	0.050	0.000	0.002
b	0.200	0.300	0.008	0.012
b1	0.130	0.230	0.005	0.009
c	0.070	0.170	0.003	0.007
D	0.950	1.050	0.037	0.041
D2	0.430	0.530	0.017	0.021
e	0.650(BSC).		0.026(BSC).	
E	0.950	1.050	0.037	0.041
E2	0.430	0.530	0.017	0.021
L	0.200	0.300	0.008	0.012
L1	0.270	0.370	0.011	0.015
L2	0.077(REF).		0.003(REF).	
L3	0.050(REF).		0.002(REF).	
L4	0.340(REF).		0.013(REF).	
L5	0.200(REF).		0.008(REF).	
R	0.050(REF).		0.002(REF).	
h	0.060(REF).		0.002(REF).	

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