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.

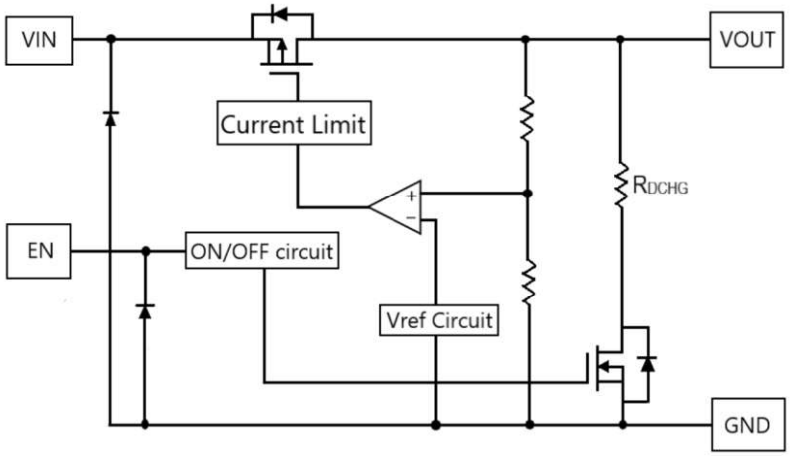
Features

- 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℃
- Current Limit and Short Circuit Protection
- Fixed Output Voltage: 1.2V to 4.0V
- Low ESR Capacitors: C_{in}=1μF, C_L=1μF
- Miniature Packages: SOT-23, SOT-23-5L, and DFN1x1-4L
- RoHS Compliant, 100%Pb & Halogen Free

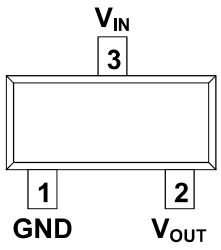
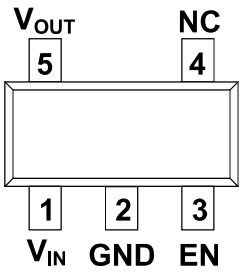
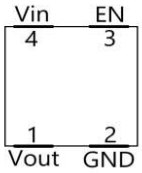
Applications

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

Block Diagram

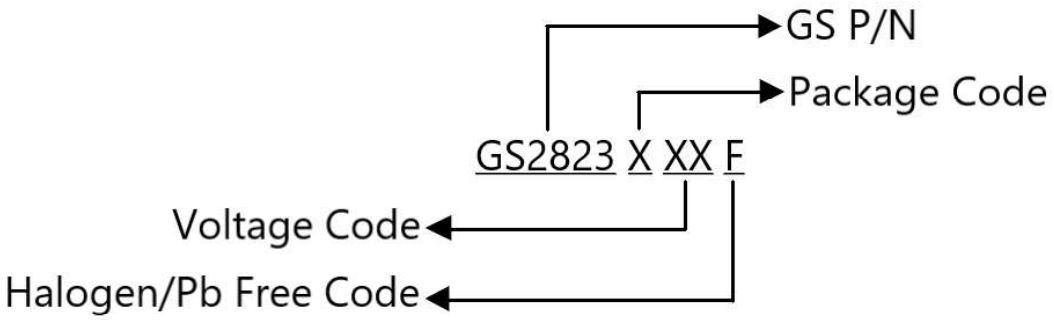


Packages & Pin Assignments

SOT-23	SOT-23-5L	DFN1X1-4L
		

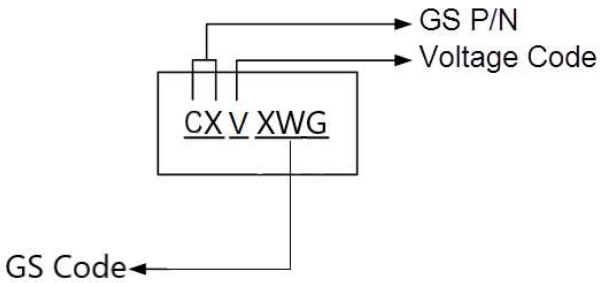
Pin Name	Function
NC	No Connect.
EN	Enable Input. Pulling this pin below 0.3V turn the regulator off, reducing the quiescent current to a fraction of its operating value. The device will be enabled if this pin is left open. Connect to V_{IN} if not being used.
GND	Ground Pin.
V_{IN}	Power Supply Input.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

Ordering Information

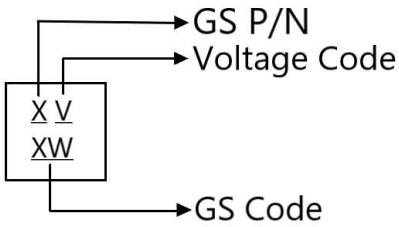


SOT-23	SOT-23-5L	DFN1x1-4L	Output Voltage
GS2823Z12F	GS2823L12F	GS2823F12F	1.2V
GS2823Z15F	GS2823L15F	GS2823F15F	1.5V
GS2823Z18F	GS2823L18F	GS2823F18F	1.8V
GS2823Z25F	GS2823L25F	GS2823F25F	2.5V
GS2823Z28F	GS2823L28F	GS2823F28F	2.8V
GS2823Z33F	GS2823L33F	GS2823F33F	3.3V
GS2823Z40F	GS2823L40F	GS2823F40F	4.0V

Marking Information



SOT-23/SOT-23-5L (Z/L Type)



DFN1x1-4L (F Type)

SOT-23	SOT-23-5L	Marking	DFN1x1-4L	Marking	Output Voltage
GS2823Z12F	GS2823L12F	CXD$_{XWG}$	GS2823F12F	XD XW	1.2V
GS2823Z15F	GS2823L15F	CXG$_{XWG}$	GS2823F15F	XG XW	1.5V
GS2823Z18F	GS2823L18F	CXF$_{XWG}$	GS2823F18F	XF XW	1.8V
GS2823Z25F	GS2823L25F	CXH$_{XWG}$	GS2823F25F	XH XW	2.5V
GS2823Z28F	GS2823L28F	CXJ$_{XWG}$	GS2823F28F	XJ XW	2.8V
GS2823Z33F	GS2823L33F	CXR$_{XWG}$	GS2823F33F	XR XW	3.3V
GS2823Z40F	GS2823L40F	CXU$_{XWG}$	GS2823F40F	XU XW	4.0V

Absolute Maximum Ratings

(T_A=25°C unless otherwise specified)

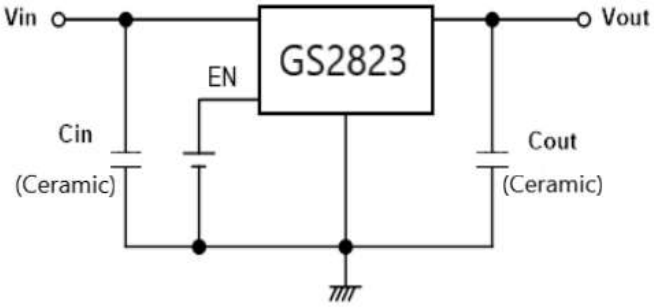
Symbol	Parameter		Max	Units
V_{IN}	Power Supply Voltage		7.0	V
V_{EN}	Enable Voltage		7.0	V
V_{OUT}	Output Voltage		-0.3 to V_{IN}	V
I_{OUT}	Output Current		500	mA
P_D	Power Dissipation	SOT-23-5L	600	mW
		SOT-23	560	
		DFN1x1-4L	340	
T_{STG}	Storage Temperature Range		-55 to 125	°C
T_A	Operating Ambient 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 Ambient	SOT-23-5L	166	°C/W
		SOT-23	179	
		DFN1x1-4L	294	

Electrical Characteristics

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

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}\geqq$2V	V_{OUT} x0.99	V_{OUT}	V_{OUT} x1.01	
I_{OUTMAX}	Max Output Current	$V_{IN}\geq V_{OUT}+1.0V$	1.2V≤V_{OUT}≤4.0V	300	-	-	mA
ΔV_{LINE}	Line regulation	$V_{OUT}+0.5V\leq V_{IN}\leq 5.5V$ I_{OUT} = 50mA	1.2V≤V_{OUT}≤4.0V	-	0.01	0.1	%/V
ΔV_{LOAD}	Load Regulation	$V_{IN}=V_{OUT}+1V$ 0.1mA≤I_{OUT}≤300mA	1.2V≤V_{OUT}≤4.0V	-	25	45	mV
V_{DROP}	Dropout Voltage	I_{OUT} = 300mA	1.2V≤V_{OUT}<1.3V	-	0.48	0.63	V
			1.3V≤V_{OUT}<1.4V	-	0.44	0.58	
			1.4V≤V_{OUT}<1.5V	-	0.42	0.52	
			1.5V≤V_{OUT}<1.6V	-	0.42	0.46	
			1.6V≤V_{OUT}<1.8V	-	0.40	0.44	
			1.8V≤V_{OUT}<2.0V	-	0.30	0.41	
			2.0V≤V_{OUT}<2.5V	-	0.27	0.38	
			2.5V≤V_{OUT}<3.0V	-	0.24	0.35	
			3.0V<V_{OUT}≤4.0V	-	0.20	0.31	
$\triangle V_{OUT}/\triangle T$	Output Voltage Temperature Coefficient	$V_{IN}=V_{OUT}+1V$, I_{OUT}=10mA, -40°C≤T_A≤85°C		-	±100	-	ppm/°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}=0~5.5V		-	150	-	mA
R_{DCHG}	On Resistance for Discharge	V_{IN}=5.5V, V_{OUT}= 2V, V_{EN}=0V		-	280	-	Ω

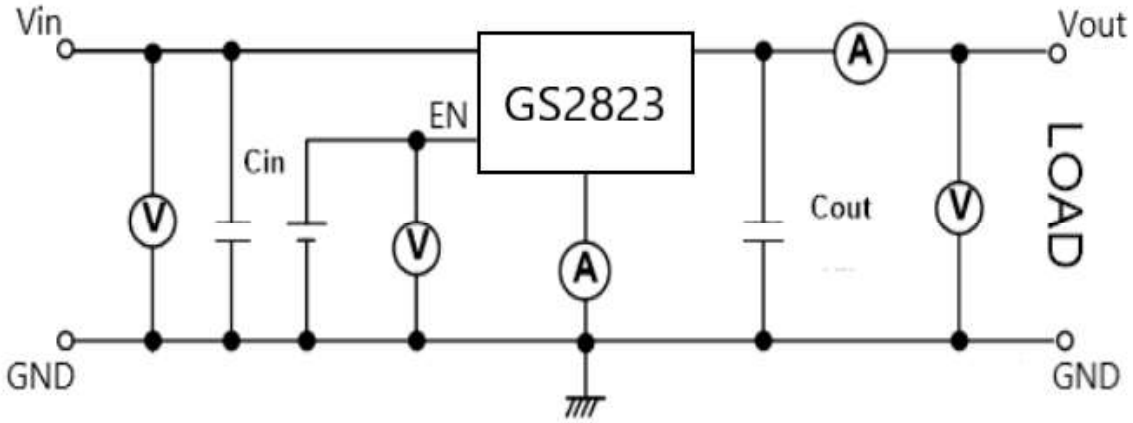
Typical Applications



C_{IN} : 1μF or more. C_{OUT} : 1μF or more

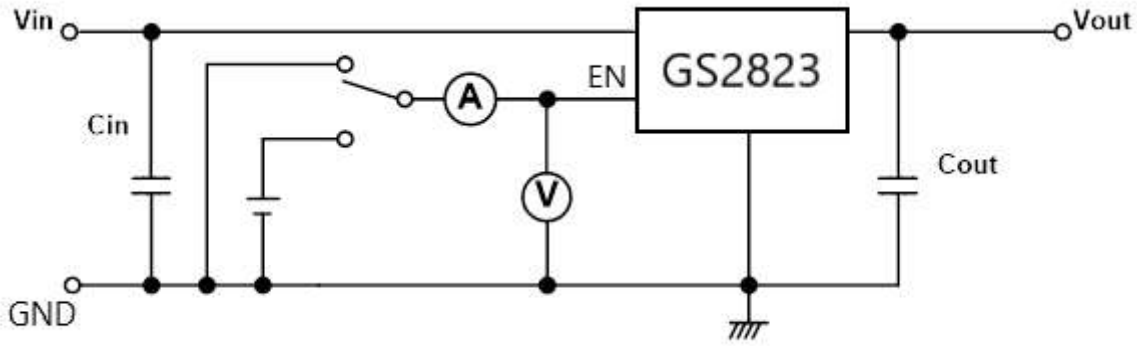
Test Circuit

Operating Function Test



C_{IN} : 1μF or more. C_{OUT} : 1μF or more

Enable Function Test



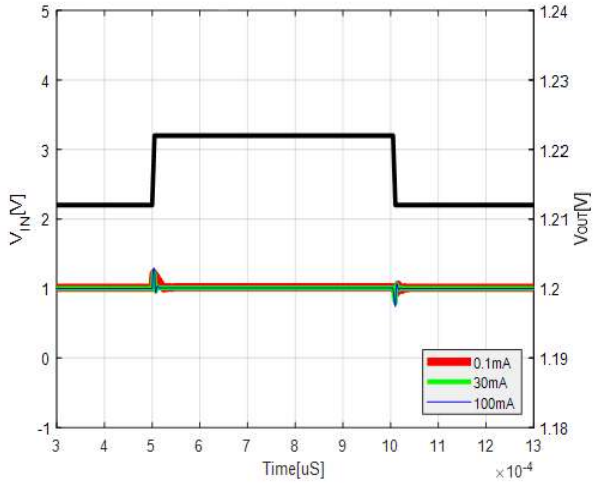
C_{IN} : 1μF or more. C_{OUT} : 1μF or more

Typical Performance Characteristics

Line Transient response characteristics (T_A=25°C)

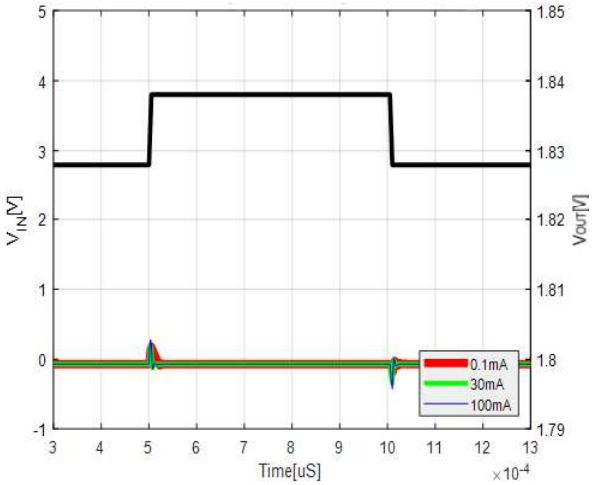
V_{OUT} = 1.2V

Cin=0.1μF, Cout=1μF, tr=tf=5μs, Vin=2.2V->3.2V



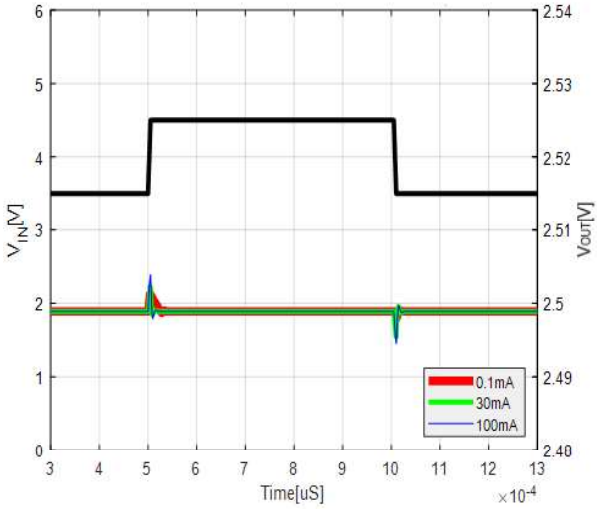
V_{OUT} = 1.8V

Cin=0.1μF, Cout=1μF, tr=tf=5μs, Vin=2.8V->3.8V



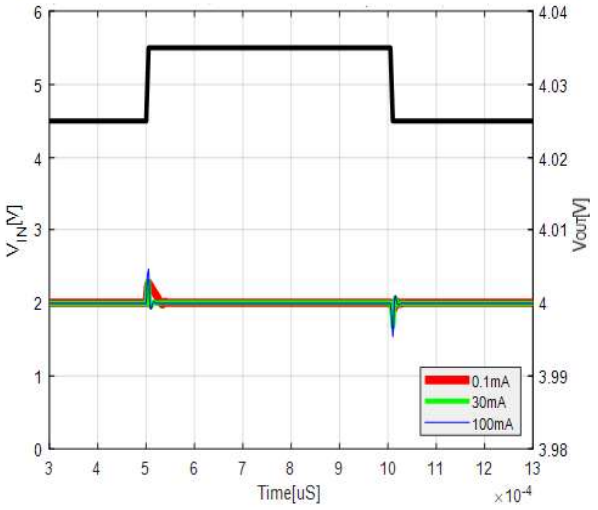
V_{OUT} = 2.5V

Cin=0.1μF, Cout=1μF, tr=tf=5μs, Vin=3.5V->4.5V



V_{OUT} = 4.0V

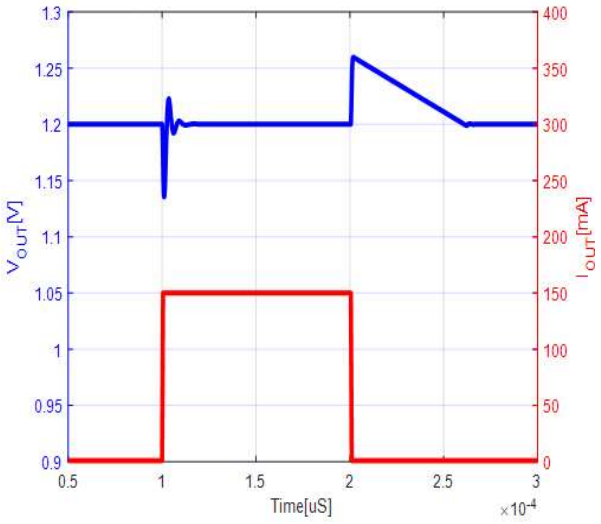
Cin=0.1μF, Cout=1μF, tr=tf=5μs, Vin=4.5V->5.5V



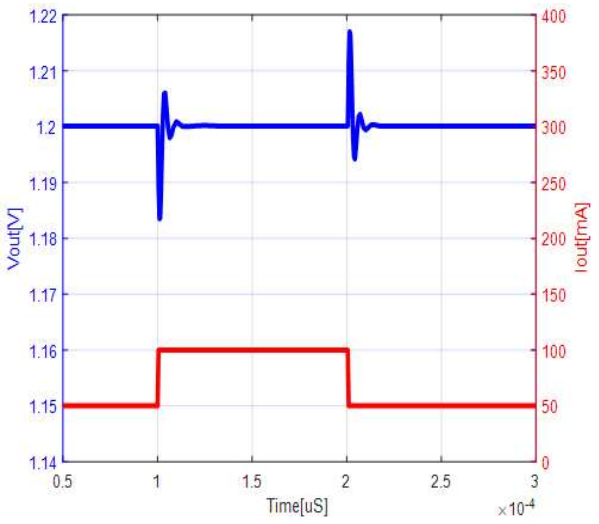
Load Transient response characteristics (T_A=25°C)

V_{OUT} = 1.2V

Iout=1mA~150mA, Tr=Tf=0.5μS, Cin=Cout=1μF

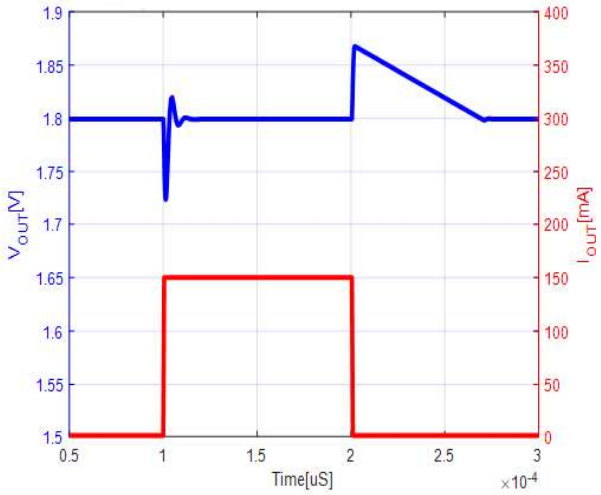


Iout=50mA~100mA, Tr=Tf=0.5μS, Cin=Cout=1μF

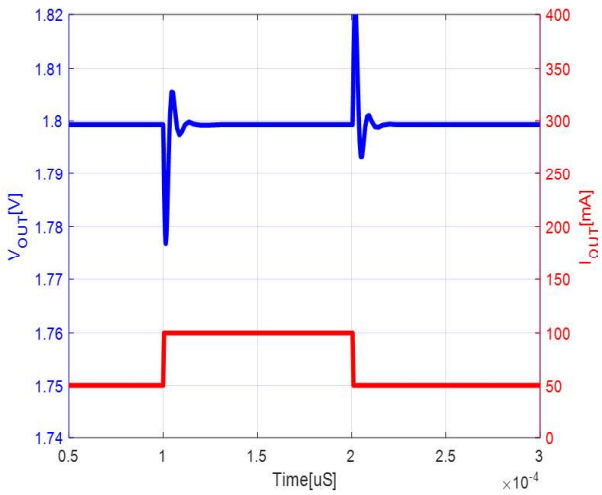


V_{OUT} = 1.8V

Iout=1mA~150mA, Tr=Tf=0.5μS, Cin=Cout=1μF

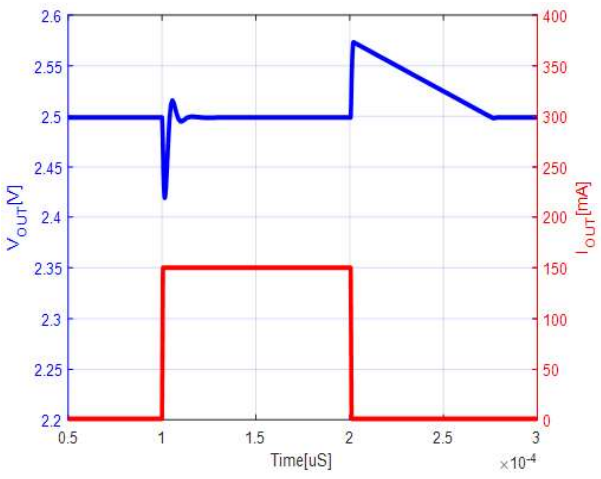


Iout=50mA~100mA, Tr=Tf=0.5μS, Cin=Cout=1μF

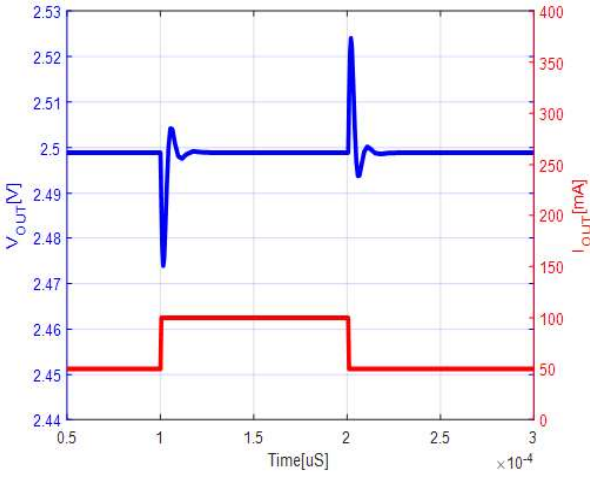


V_{OUT} = 2.5V

Iout=1mA~150mA, Tr=Tf=0.5μS, Cin=Cout=1μF



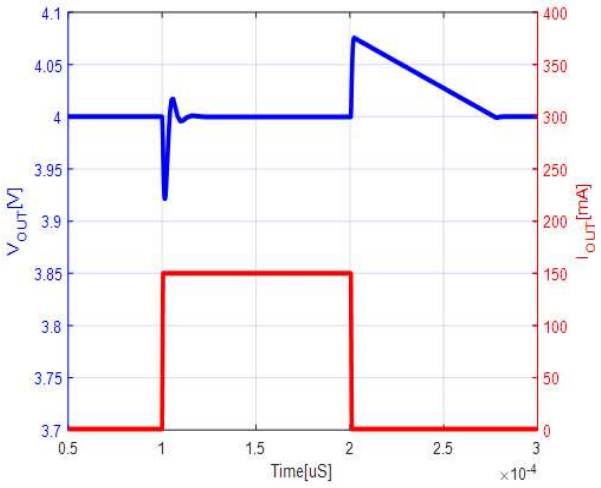
Iout=50mA~100mA, Tr=Tf=0.5μS, Cin=Cout=1μF



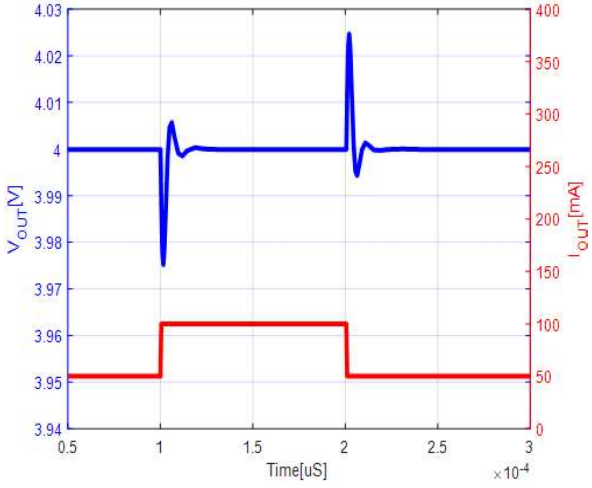
Load Transient response characteristics (T_A=25°C)

V_{OUT} = 4.0V

Iout=1mA~150mA, Tr=Tf=0.5μS, Cin=Cout=1μF

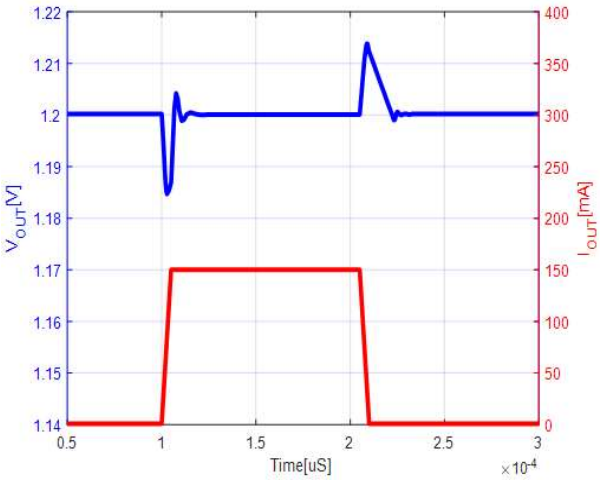


Iout=50mA~100mA, Tr=Tf=0.5μS, Cin=Cout=1μF

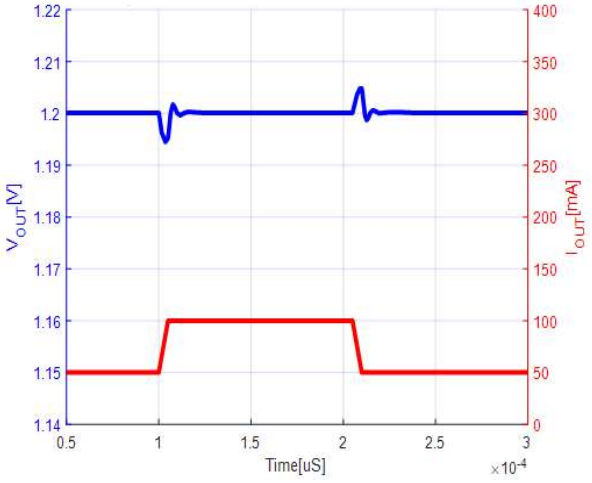


V_{OUT} = 1.2V

Iout=1mA~150mA, Tr=Tf=5μS, Cin=Cout=1μF

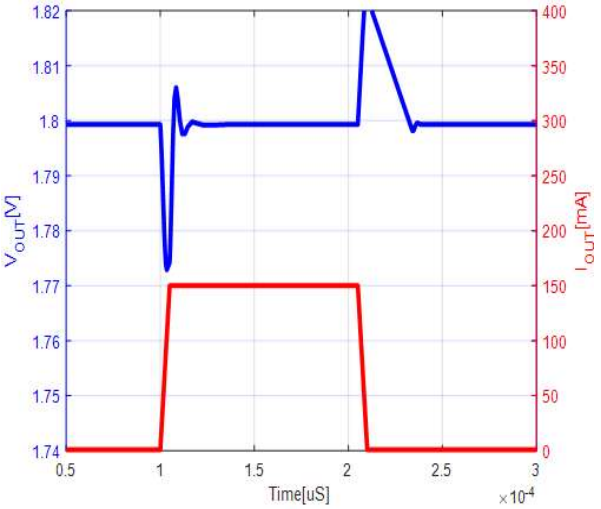


Iout=50mA~100mA, Tr=Tf=5μS, Cin=Cout=1μF

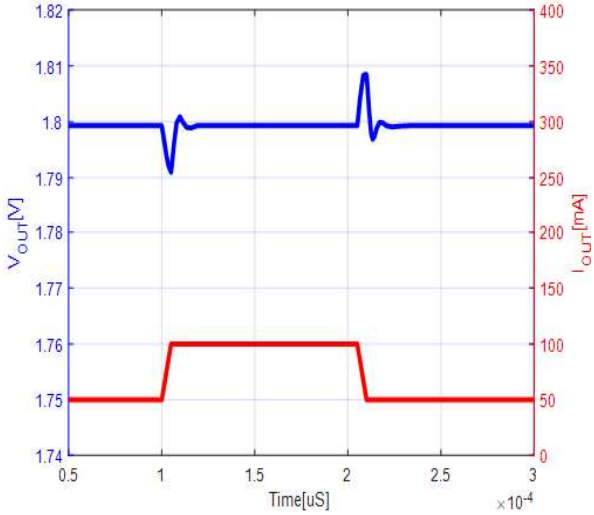


V_{OUT} = 1.8V

Iout=1mA~150mA, Tr=Tf=5μS, Cin=Cout=1μF



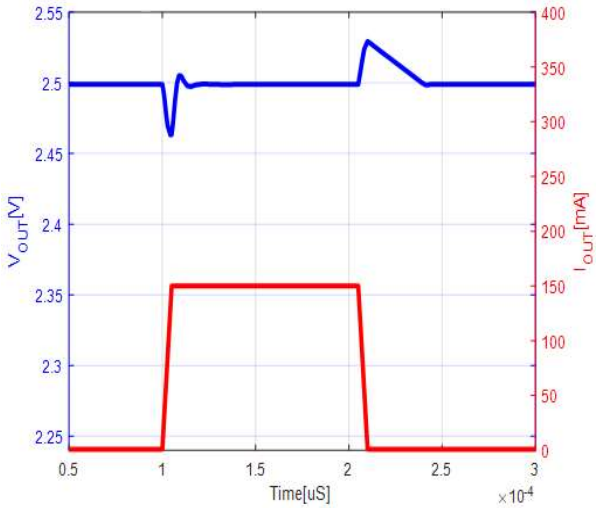
Iout=50mA~100mA, Tr=Tf=5μS, Cin=Cout=1μF



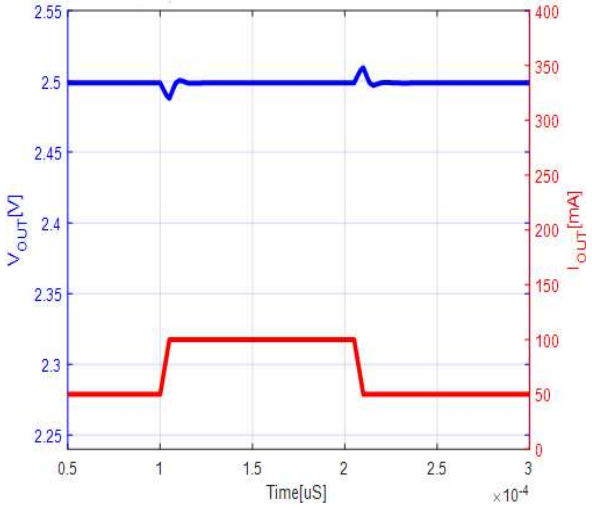
Load Transient response characteristics (T_A=25°C)

V_{OUT} = 2.5V

Iout=1mA~150mA, Tr=Tf=5μS, Cin=Cout=1μF

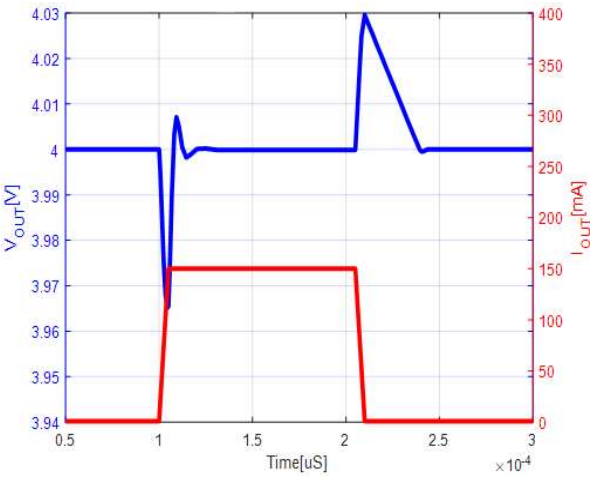


Iout=50mA~100mA, Tr=Tf=5μS, Cin=Cout=1μF

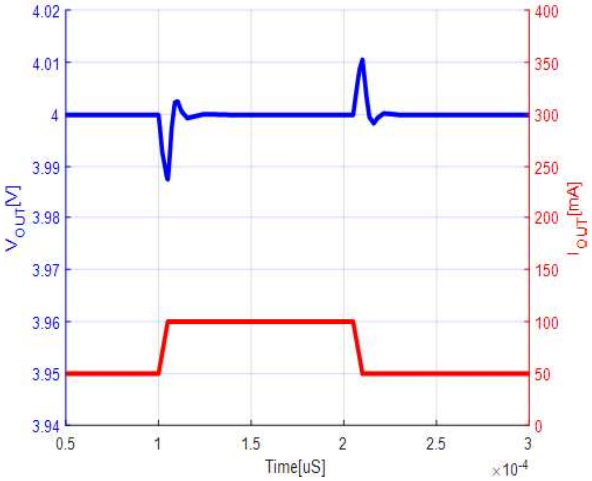


V_{OUT} = 4.0V

Iout=1mA~150mA, Tr=Tf=5μS, Cin=Cout=1μF



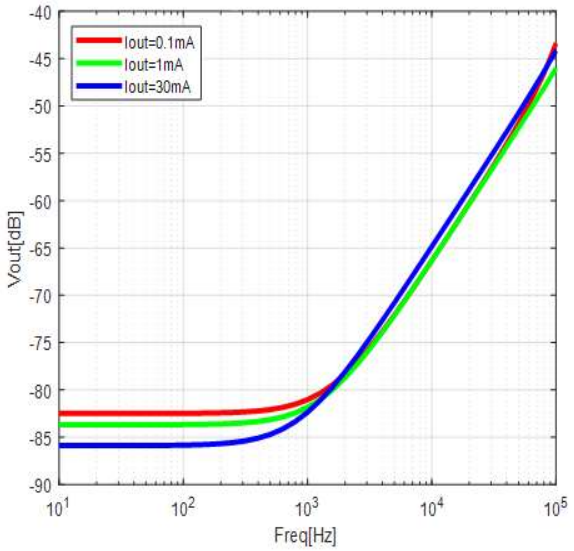
Iout=50mA~100mA, Tr=Tf=5μS, Cin=Cout=1μF



Ripple rejection (T_A=25°C)

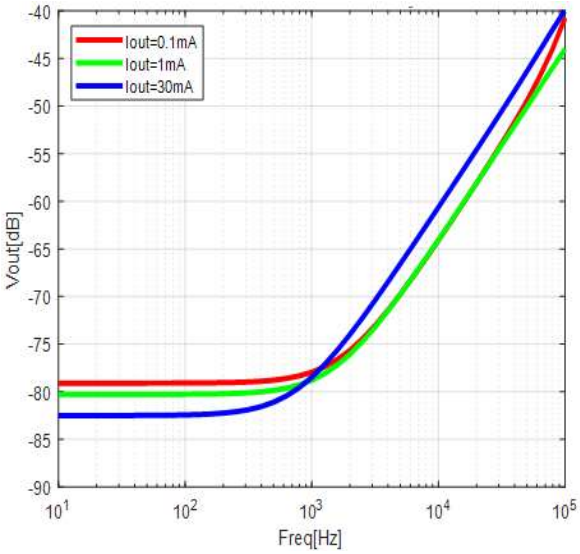
V_{OUT} = 1.2 V

Cin=Cout=1μF, Vin=2.2V



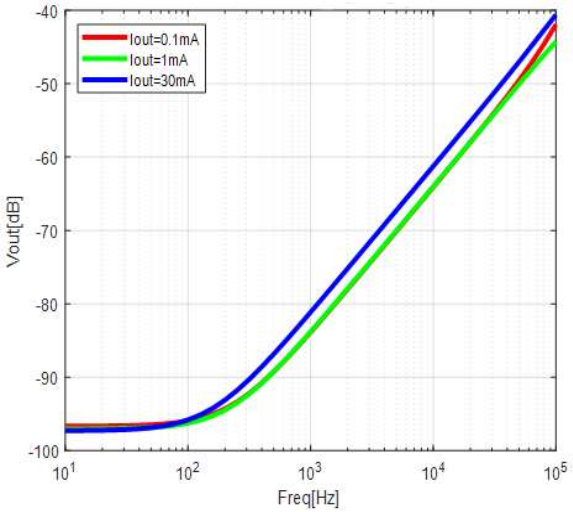
V_{OUT} = 1.8 V

Cin=Cout=1μF, Vin=2.8V



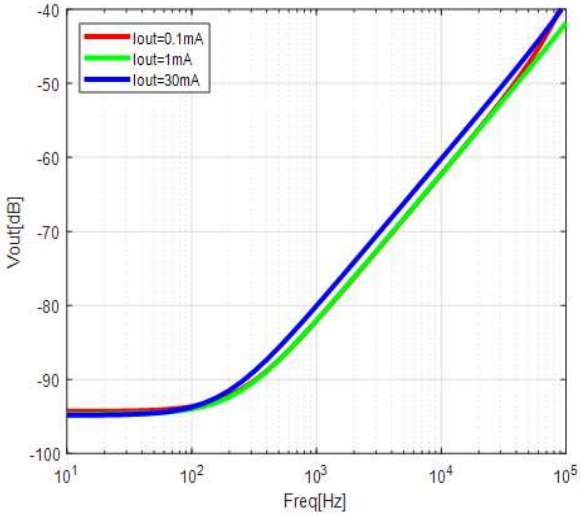
V_{OUT} = 2.5 V

Cin=Cout=1μF, Vin=3.5V



V_{OUT} = 3.3 V

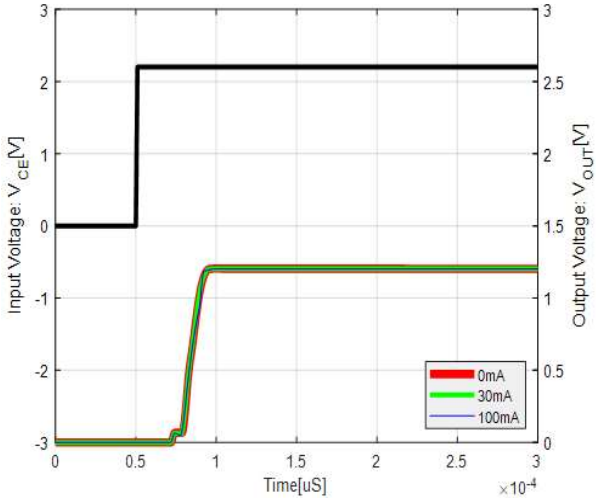
Cin=Cout=1μF, Vin=4.3V



EN Pin rising response characteristics (T_A=25°C)

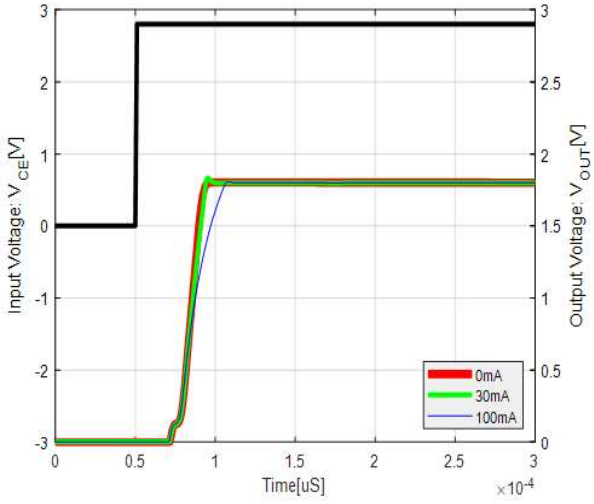
V_{OUT} = 1.2 V

Cin=0.1μF, Cout=1μF, V_{EN}=0V->2.2V



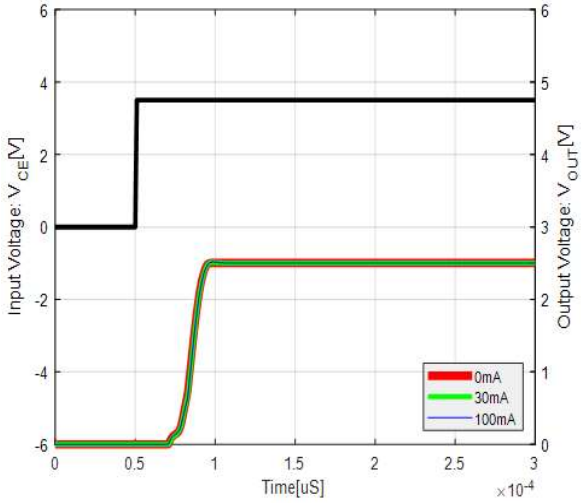
V_{OUT} = 1.8 V

Cin=0.1μF, Cout=1μF, V_{EN}=0V->2.8V



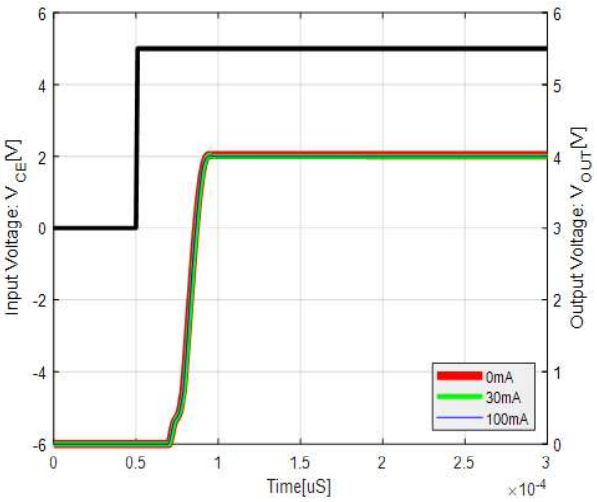
V_{OUT} = 2.5 V

Cin=0.1μF, Cout=1μF, V_{EN}=0V->3.5V



V_{OUT} = 4.0 V

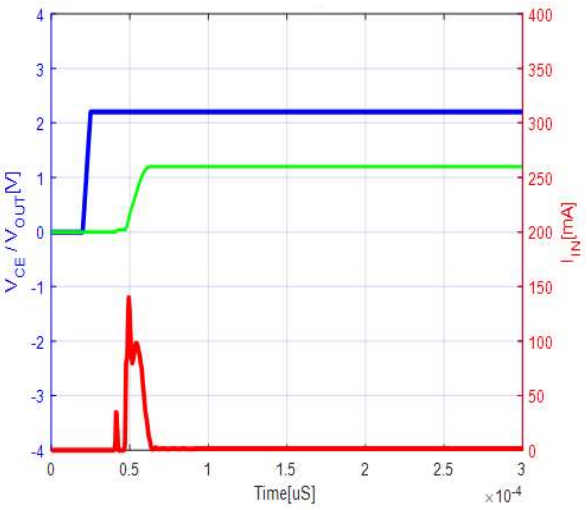
Cin=0.1μF, Cout=1μF, V_{EN}=0V->5.0V



Inrush Current Response Time(T_A=25°C)

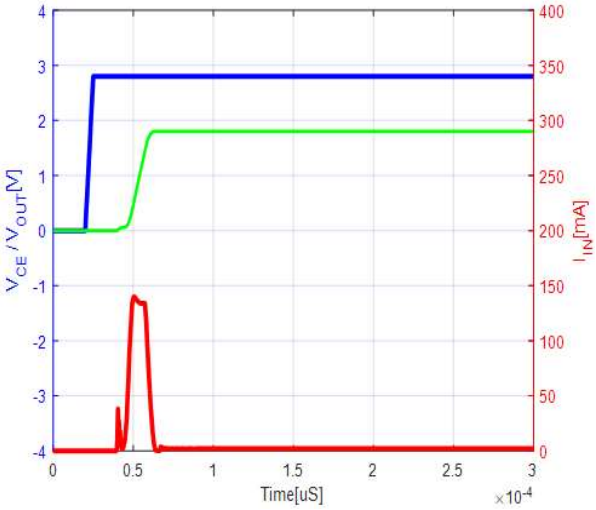
V_{OUT} = 1.2 V

V_{EN}=0V->2.2V, Tr=Tf=5μS, Cin=Cout=1μF



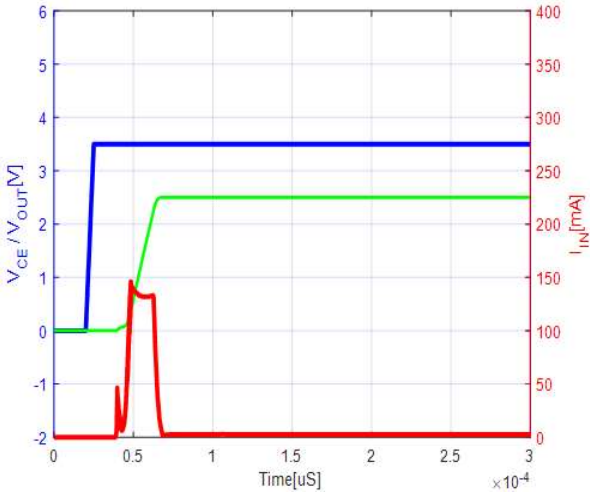
V_{OUT} = 1.8 V

V_{EN}=0V->2.8V, Tr=Tf=5μS, Cin=Cout=1μF



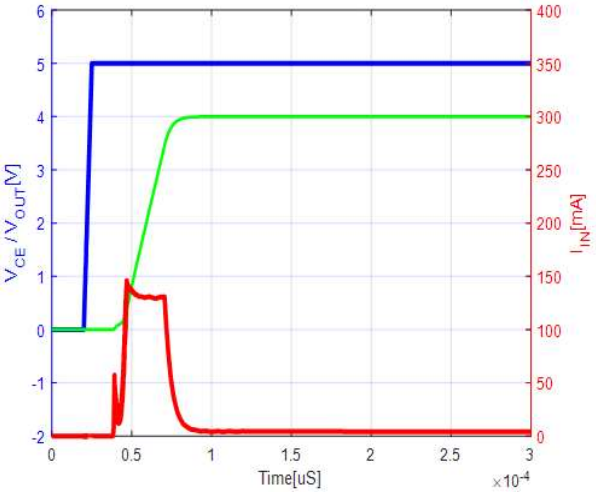
V_{OUT} = 2.5 V

V_{EN}=0V->3.5V, Tr=Tf=5μS, Cin=Cout=1μF



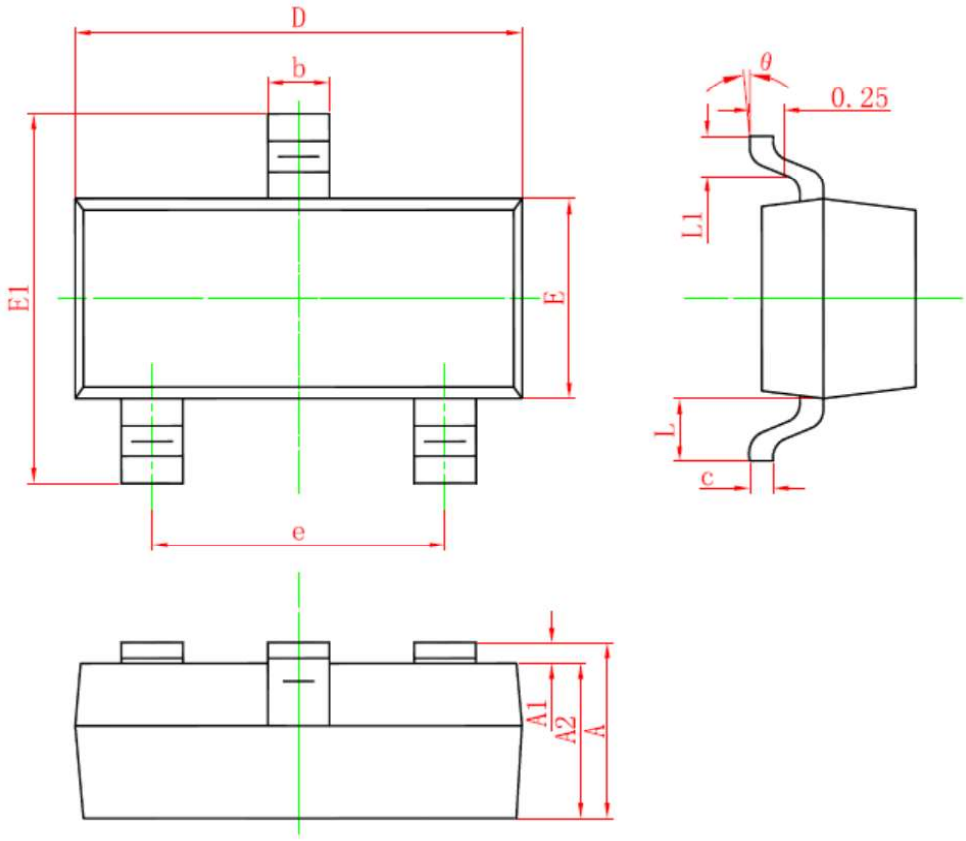
V_{OUT} = 4.0 V

V_{EN}=0V->5.0V, Tr=Tf=5μS, Cin=Cout=1μF



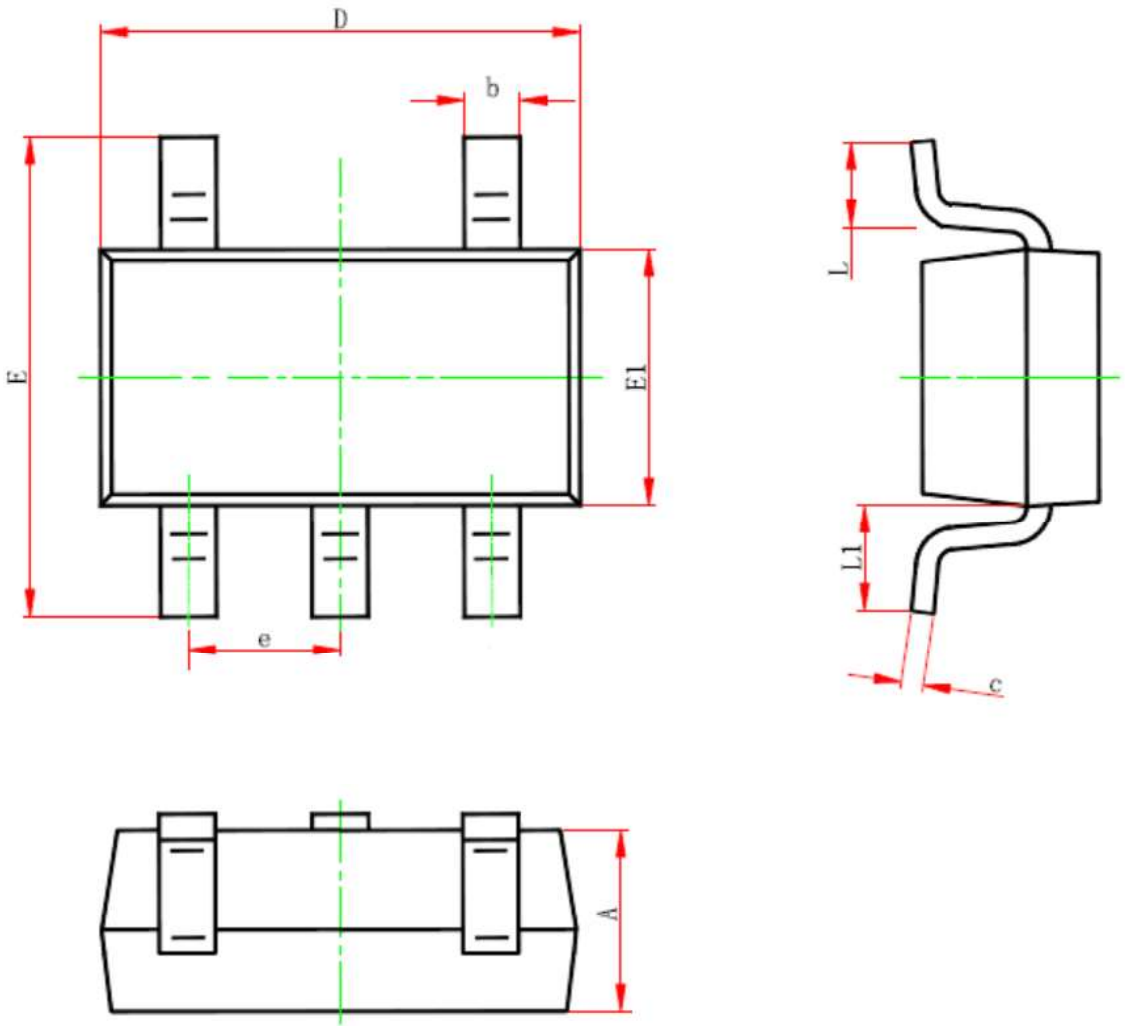
Package Dimension

SOT-23



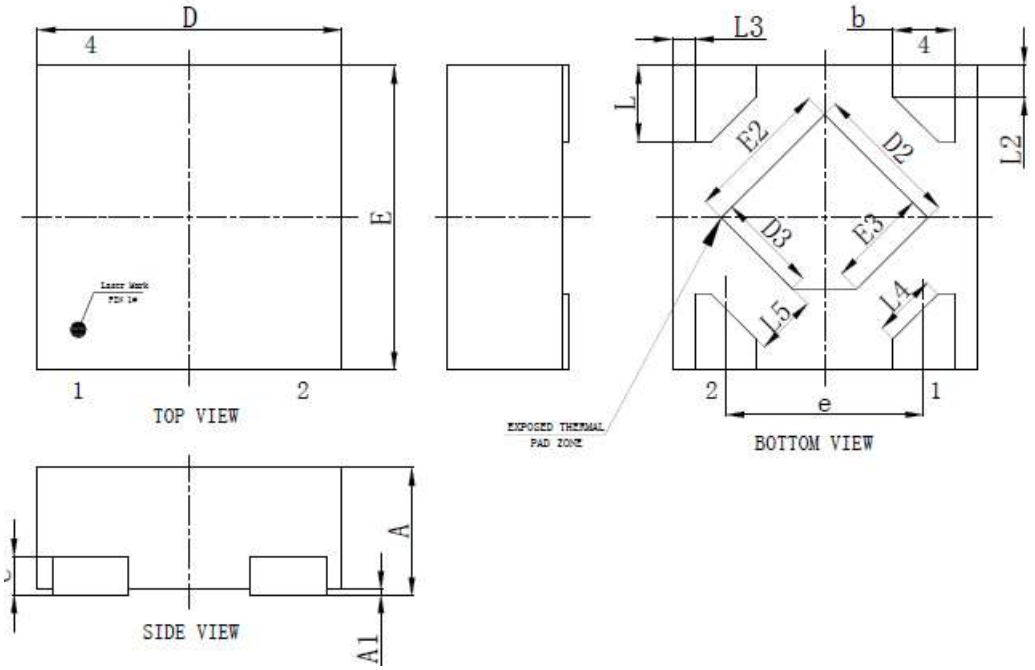
Dimensions				
SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	0.75	1.15	0.030	0.045
A1	0.00	0.10	0.000	0.004
A2	0.90	1.10	0.035	0.043
b	0.30	0.50	0.012	0.020
c	0.13	0.20	0.005	0.008
D	2.80	3.00	0.110	0.118
E	1.20	1.40	0.047	0.055
E1	2.25	2.55	0.089	0.100
e	1.90 (TYP)		0.075 (TYP)	
L	0.55 (TYP)		0.022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

NOTICE

Information furnished is believed to be accurate and reliable. However Globaltech Semiconductor assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties, which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Globaltech Semiconductor. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information without express written approval of Globaltech Semiconductor.

CONTACT US

GS Headquarter	
	4F.,No.43-1,Lane11,Sec.6,Minquan E.Rd Neihu District Taipei City 114, Taiwan (R.O.C)
	886-2-2657-9980
	886-2-2657-3630
@	sales_twn@gs-power.com

RD Division	
	824 Bolton Drive Milpitas. CA. 95035
	1-408-457-0587