

SK6017

300mA, Low Consumption, CMOS LDO

GENERAL DESCRIPTION

The SK6017 series are low dropout linear regulators and optimized to provide a high performance solution for battery power system to deliver low quiescent current. The devices offer a new level of cost effective performance in cellular phones, laptop and notebook computers, and other portable devices.

The SK6017 series are designed to make use of low cost ceramic capacitors which ensure the stability of the output current, and enhance the efficiency in order to prolong the battery life of those portable devices.

SK6017 can provide product selections of output value in the range of 1.2V~3.6V by every 0.1V step.

The SK6017 is available in SOT23-5L and SOT23 packages. Standard products are Halogen free and Pb-free products.

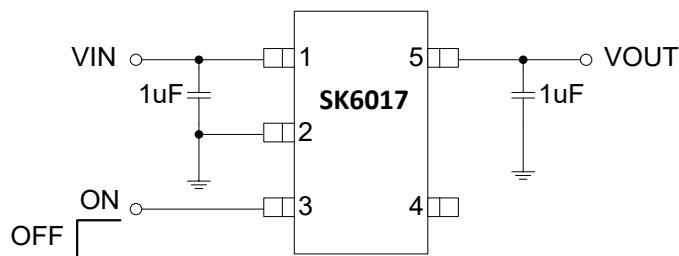
FEATURES

- Input Voltage : 2.5V~6.5V
- Output Range: 1.2V~3.6V (customized by every 0.1V step)
- Output Current: 300mA @ $V_{OUT} > 2V$, $0.5V \leq V_{IN} - V_{OUT} \leq 1V$
- Dropout Voltage: 110mV @ $I_{OUT} = 100mA$ (SOT23-5)
- Quiescent Current : 0.9 μA Typ.
- Shut-down Current: < 0.1 μA
- Recommend Capacitor: 1 μF

APPLICATIONS

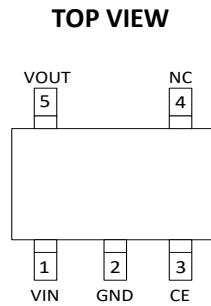
- Reference voltage source
- Toys
- Bluetooth, wireless handsets
- Others portable electronic device

TYPICAL APPLICATION CIRCUIT

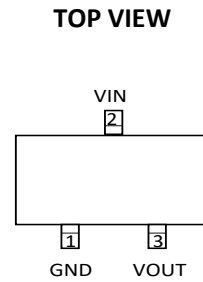


* Application Circuit for SOT23-5L

PIN CONFIGURATION



SOT23-5L



SOT23

PIN DESCRIPTION

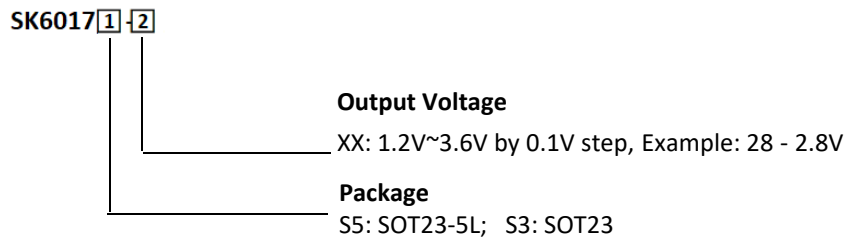
PIN NO		SYMBOL	I/O	DESCRIPTION
SOT23-5L	SOT23			
1	2	VIN	Power	Input
2	1	GND	Ground	Ground
3	/	CE	I	Chip Enable(Active high, do not float)
4	/	NC	/	Not Connected
5	3	VOUT	O	Output

ORDERING INFORMATION

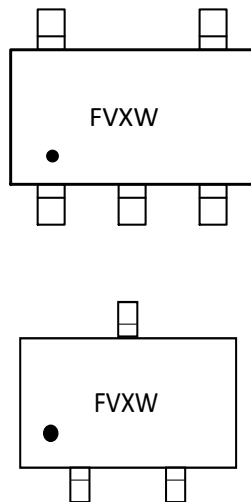
PART NO	ACCURACY	PACKAGE	TEMPERATURE	TAPE & REEL
SK6017S5-XX	2%	SOT23-5L	-40 ~ +85°C	3000/REEL
SK6017S3-XX	2%	SOT23	-40 ~ +85°C	3000/REEL

Note: XX indicates 1.2V~3.6V by 0.1V step. For example, 33 means product outputs 3.3V.

PART NUMBER RULES



MARKING DESCRIPTION:



“F”: Product Code, Stands for SK6017

“V”: Output Voltage Code

“X”: Internal Control Code

“W”: Week of manufacturing.

“A” stands for week 1,

“Z” stands for week 26,

“ $\bar{A}$ ” stands for week 27,

“ $\bar{Z}$ ” stands for week 52,

TYPICAL OUTPUT VOLTAGE CODE TABLE

Vout	CODE	Vout	CODE
1.2V	O	1.5V	P
1.8V	Q	2.5V	R
2.8V	D	3.0V	E
3.3V	F	3.6V	G

ABSOLUTE MAXIMUM RATINGS (Note)

SYMBOL	ITEMS		VALUE	UNIT
V_{IN}	Input Voltage		-0.3~8	V
I_{OUT}	Output Current* ¹		500	mA
P_{DMAX}	Power Dissipation	SOT23-5L	0.45	W
		SOT23	0.4	W
$R_{\theta JA}$	Thermal Resistance	SOT23-5L	270	°C /W
		SOT23	300	
T_J	Junction Temperature		-40~125	°C
T_A	Ambient Temperature		-40~85	°C
T_{STG}	Storage Temperature		-55~150	°C
T_{SOLDER}	Package Lead Soldering Temperature		260°C , 10s	

Note: Exceed these limits to damage to the device. Exposure to absolute maximum rating conditions may affect device reliability. *1: $V_O=3.3V$, $V_{in}=4.3V$

RECOMMENDED OPERATING RANGE

SYMBOL	ITEMS	VALUE	UNIT
V_{IN}	V_{IN} Supply Voltage	2.5 to 6.5	V
I_{OUT}	Output Current	<300	mA
T_{OPT}	Operating Temperature	-40 to +85	°C

ELECTRICAL CHARACTERISTICS

The following specifications apply for $V_{IN}=V_{OUT}+1V$, $T_A=25^{\circ}C$, unless specified otherwise.

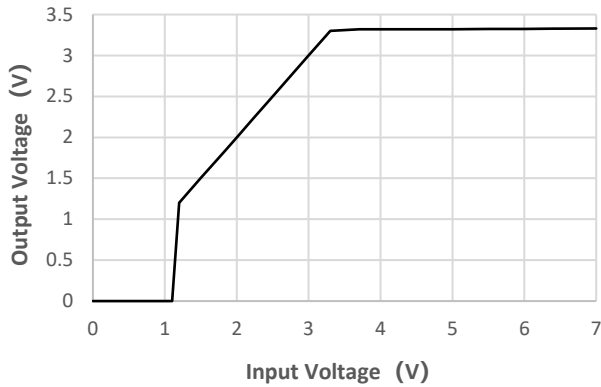
SYMBOL	ITEMS	CONDITIONS	MIN	TYP	MAX	UNIT
V_{IN}	Input Voltage	See Note 1	2.5		6.5	V
V_{OUT}	Output Range	$I_{OUT}=1mA$, $V_{OUT} \geq 1.5V$	-2	V_{SET}	2	%
		$I_{OUT}=1mA$, $1.2V \leq V_{OUT} < 1.5V$	-30	V_{SET}	30	mV
I_Q	Quiescent Current	$V_{OUT}=3.3V$, $I_{OUT}=0$		0.9	2	μA
I_{LIMIT}	Current Limit	$V_{IN}=V_{CE}$, $V_{IN}=3.8V$, $V_{OUT}=3.3V$		350		mA
V_{DROP}	Dropout Voltage	$V_{OUT}=3.3V$, $I_{OUT}=200mA$		220	250	mV
		$V_{OUT}=3.3V$, $I_{OUT}=250mA$		280	310	
		$V_{OUT}=3.3V$, $I_{OUT}=200mA$		250	280	mV
		$V_{OUT}=3.3V$, $I_{OUT}=250mA$		330	360	
ΔV_{LINE}	Line Regulation ΔV_{OUT}	$V_{IN}=3.3 \sim 5.5V$, $I_{OUT}=1mA$		2	9	mV
ΔV_{LOAD}	Load Regulation	$V_{OUT} \geq 1.8V$, $V_{IN}=V_{OUT}+1V$, $I_{OUT}=1 \sim 300mA$ $V_{OUT} \leq 1.5V$, $V_{IN}=2.5V$, $I_{OUT}=1 \sim 250mA$ (SOT23-5L)		25	36	mV
		$V_{OUT} \geq 1.8V$, $V_{IN}=V_{OUT}+1V$, $I_{OUT}=1 \sim 300mA$ $V_{OUT} \leq 1.5V$, $V_{IN}=2.5V$, $I_{OUT}=1 \sim 250mA$ (SOT-23)		55	80	mV
I_{SHORT}	Short Current	$V_{CE}=V_{IN}$, V_{OUT} Short to GND with 1Ω		130		mA
I_{SHDN}	Shut-down Current	$V_{CE}=0V$		0.1	1	μA
V_{CEH}	CE Logic High Voltage	$V_{IN}=5.5V$, $I_{OUT}=1mA$	1.2		V_{IN}	V
V_{CEL}	CE Logic Low Voltage	$V_{IN}=5.5V$, $V_{OUT}=0V$			0.4	V
I_{CE}	CE Input Current	$V_{CE}=0$ to $5.5V$			1.0	μA

Note 1: On the minimum input voltage condition, the load capability is about 30mA.

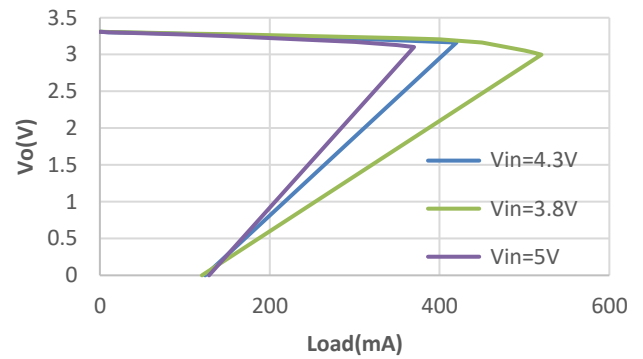
TYPICAL PERFORMANCE CHARACTERISTICS

$C_{IN}=1\mu F$, $C_{OUT}=1\mu F$, $T_{OPT}=25^{\circ}C$, $V_{IN}=5V$, $V_{OUT}=3.3V$, unless otherwise notified.

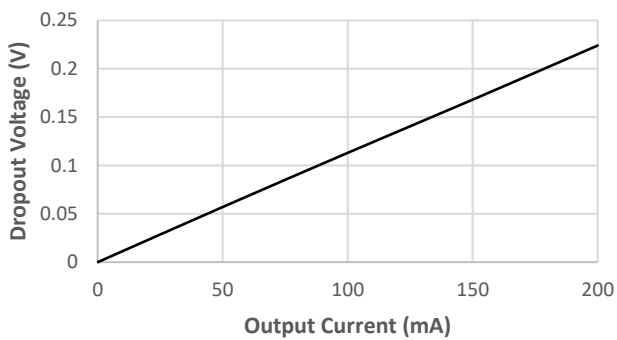
Line Regulation



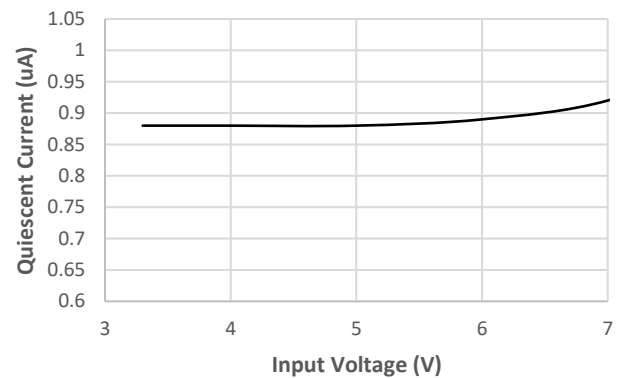
**Load Regulation
(SOT23-5L)**



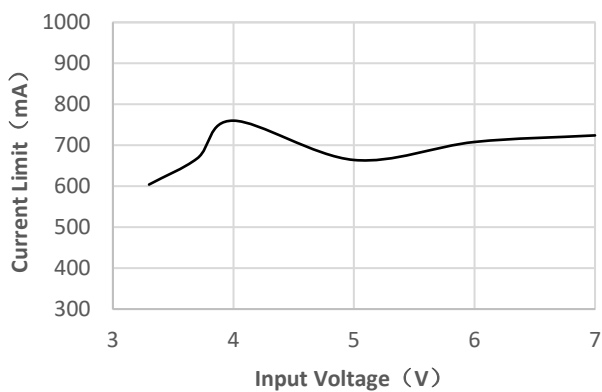
**Dropout Voltage vs. Output Current
(SOT23-5L)**



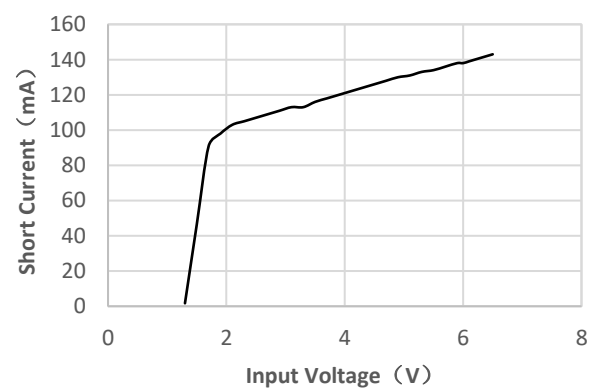
Quiescent Current vs. Input Voltage



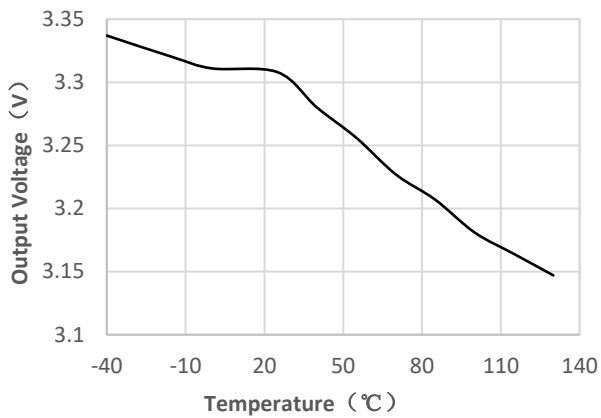
Current Limit vs. Input Voltage



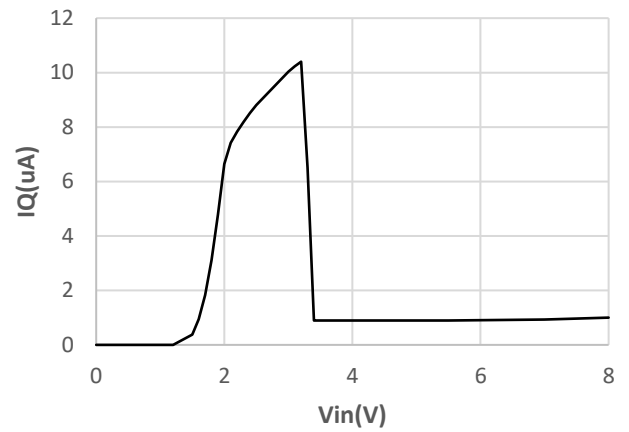
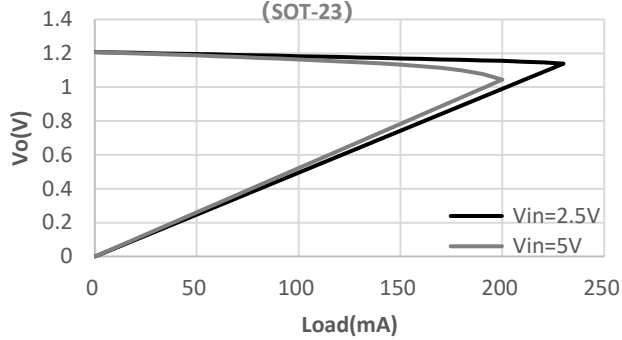
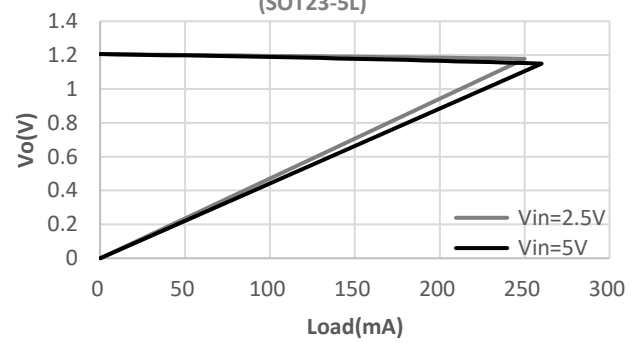
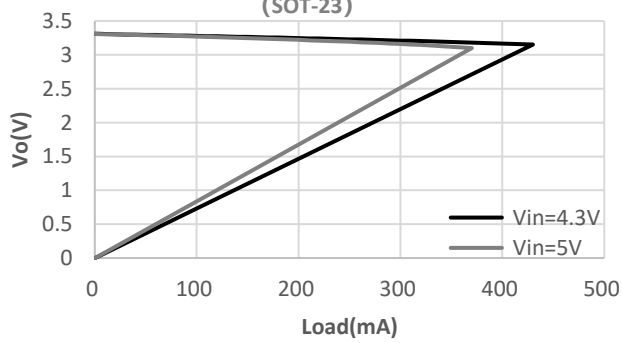
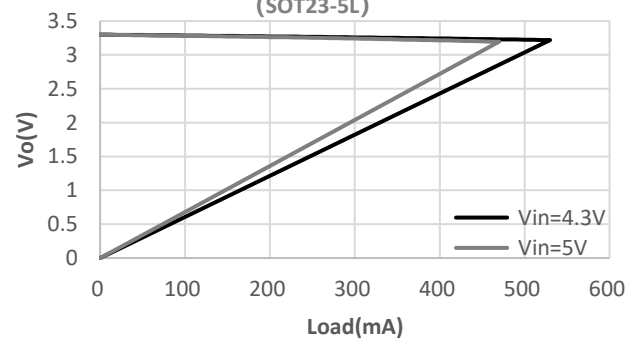
Short Current vs. Input Voltage



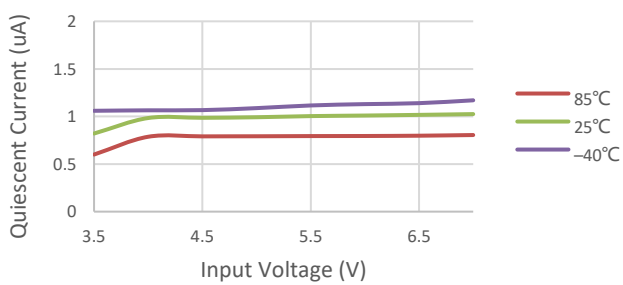
Output Voltage vs. Temperature



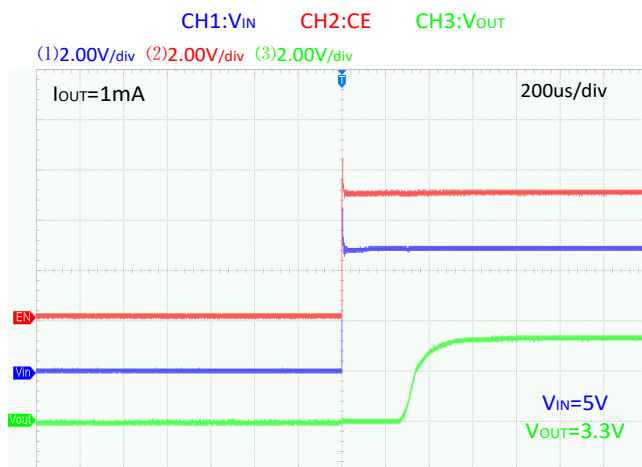
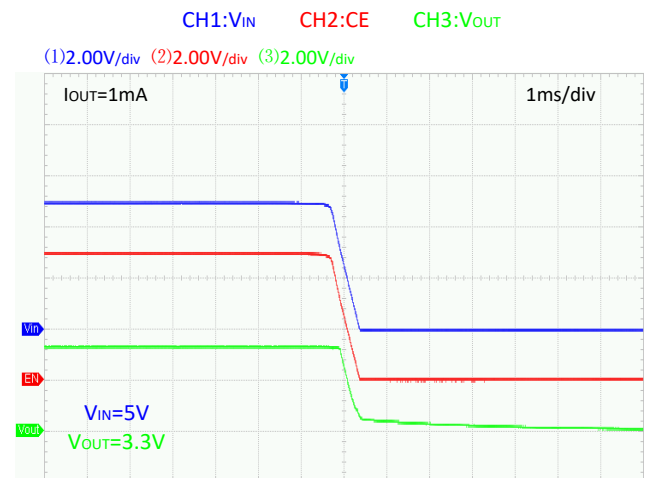
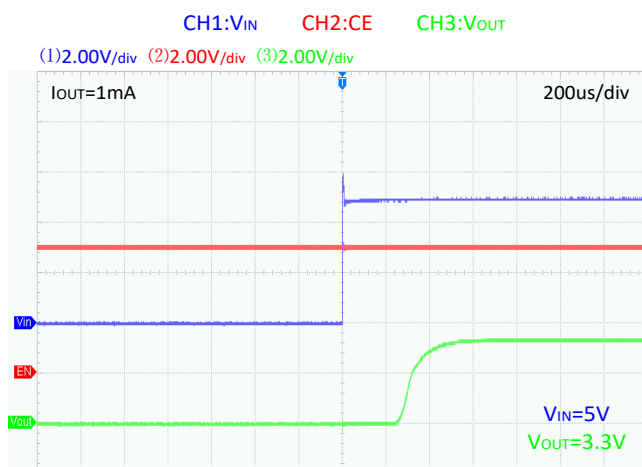
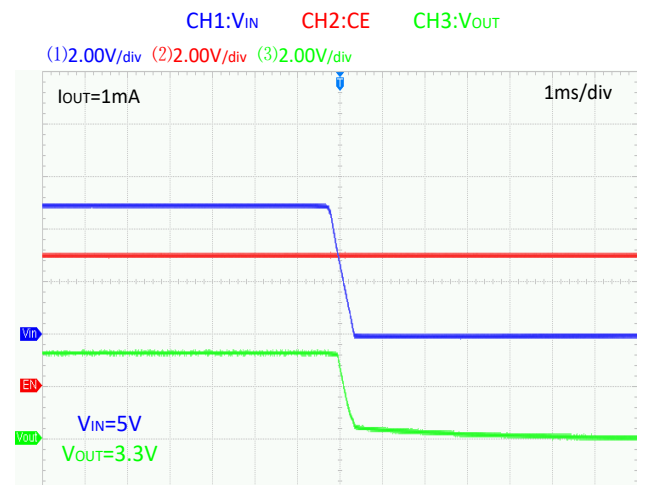
IQ vs Vin

Load Regulation-1.2V
(SOT-23)Load Regulation-1.2V
(SOT23-5L)Load Regulation-3.3V
(SOT-23)Load Regulation-3.3V
(SOT23-5L)

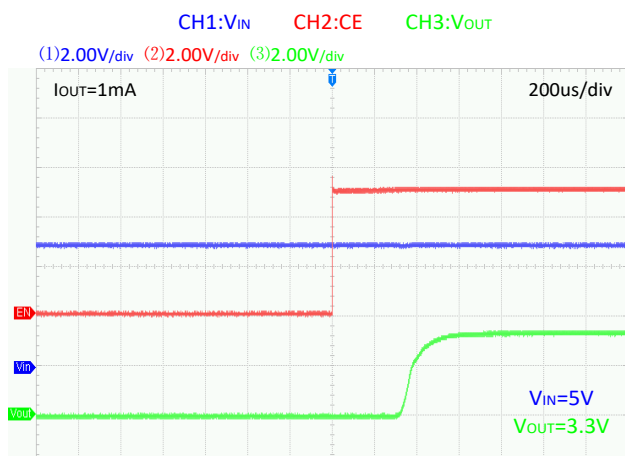
Quiescent Current vs. Input Voltage



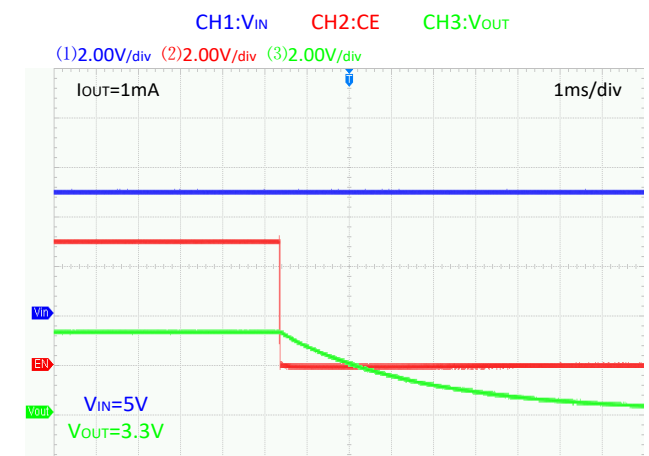
Power ON/OFF:

 V_{IN} , CE Both ON V_{IN} , CE Both OFF V_{IN} ON V_{IN} OFF

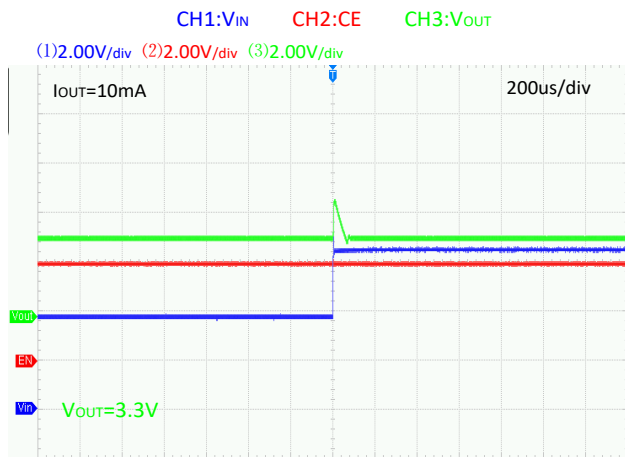
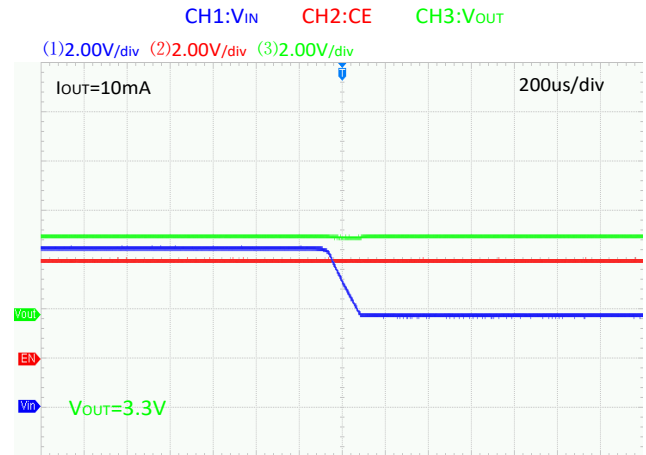
CE ON



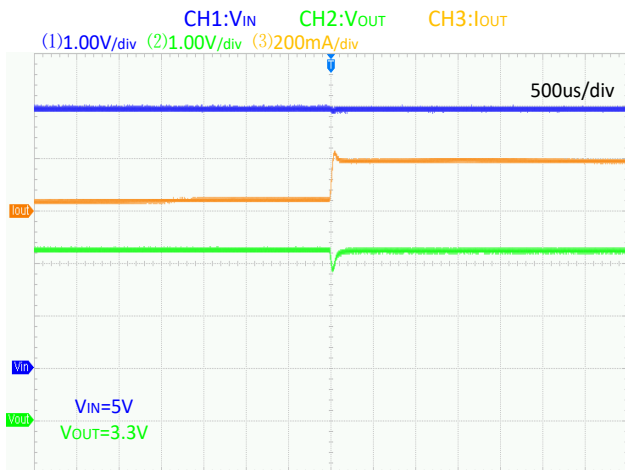
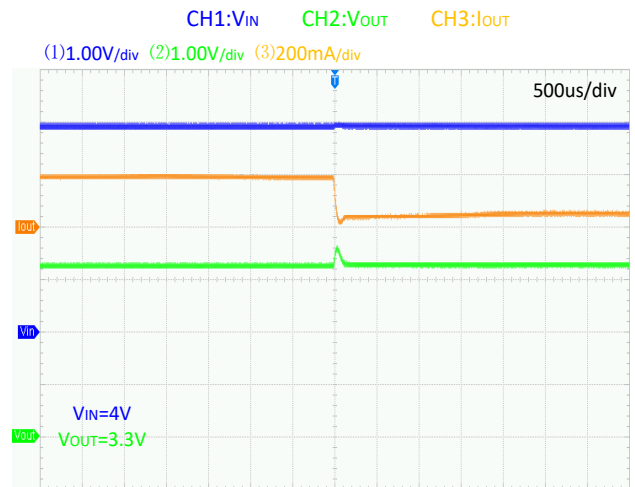
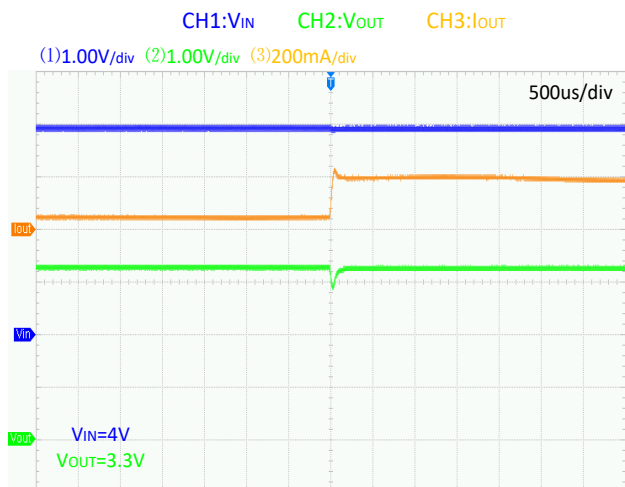
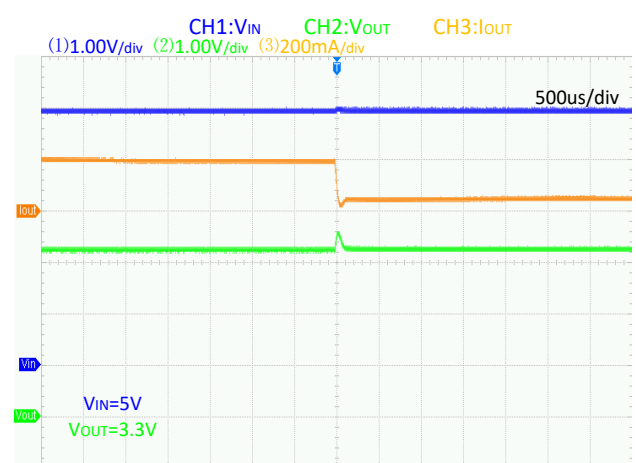
CE OFF

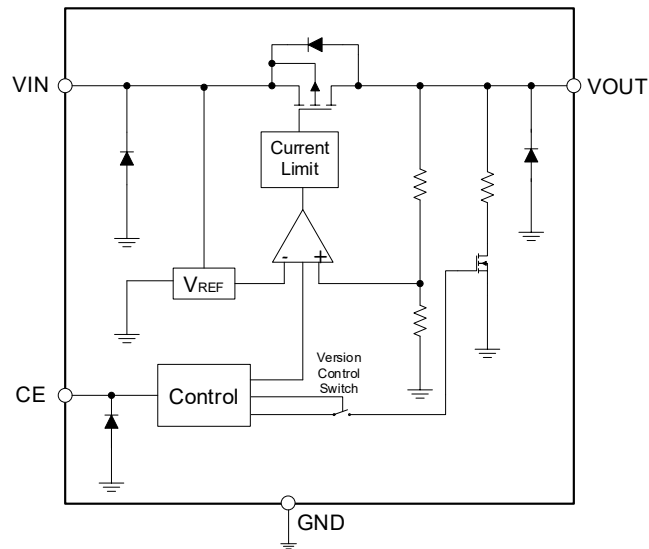


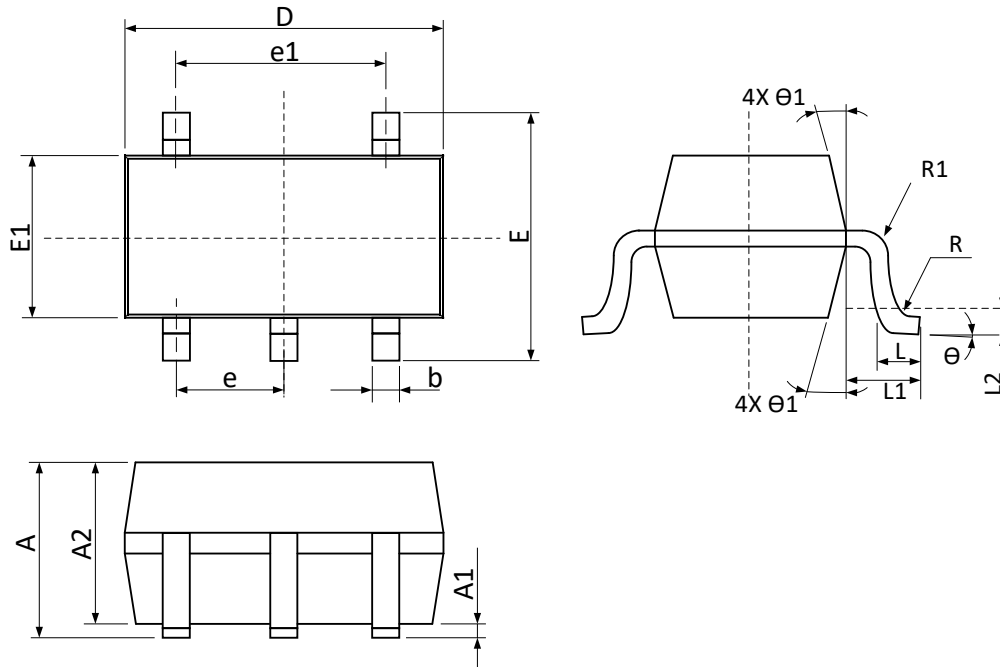
Line transient response:

 $V_{IN}=4V$ to 6.5V

 $V_{IN}=6.5V$ to 4V


Load transient response:

 $I_{OUT}=50mA$ to 200mA

 $I_{OUT}=200mA$ to 50mA


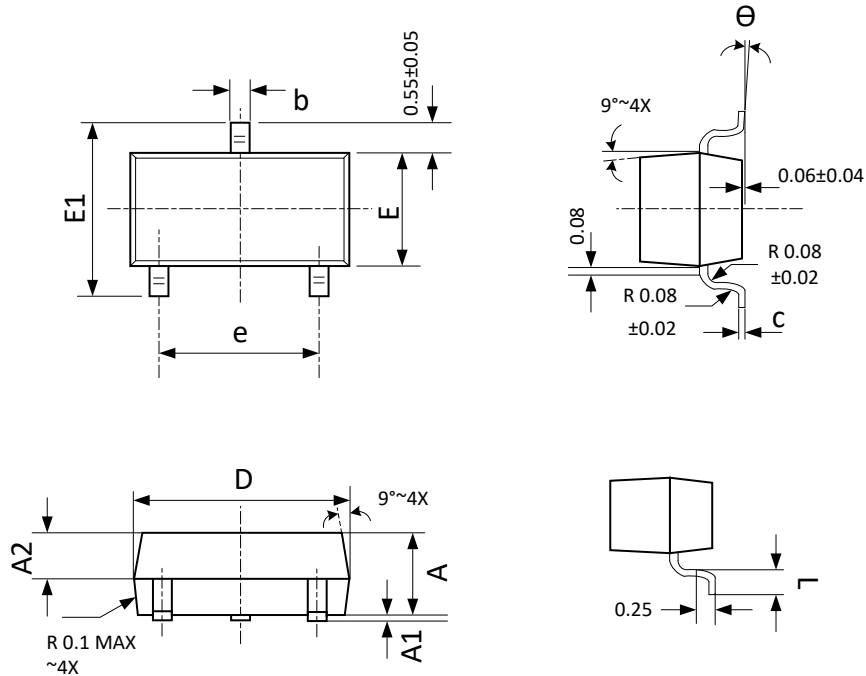
BLOCK DIAGRAM

PACKAGE DIMENSIONS: SOT23-5L


Unit: mm

DIMENSIONS IN MILLIMETERS			
SYMBOL	MINIMUM	NOMINAL	MAXIMUM
A	-	-	1.35
A1	0.00	-	0.15
A2	1.00	1.10	1.20
b	0.30	-	0.50
D	2.82	2.92	3.02
E	2.60	2.80	3.00
E1	1.50	1.60	1.70
e	0.90	0.95	1.00
e1	1.80	1.90	2.00
L	0.30	0.45	0.60
L1	0.60 REF		
L2	0.25 REF		
R	0.10	-	-
R1	0.10	-	0.25
θ	0°	4°	8°
θ1	5°	10°	15°

PACKAGE DIMENSIONS: SOT23



Unit: mm

DIMENSIONS IN MILLIMETERS			
SYMBOL	MINIMUM	NOMINAL	MAXIMUM
A	0.95	-	1.00
A1	0.02	0.06	0.10
A2	-	0.60	-
b	0.37	0.40	0.43
c	0.085	0.10	0.13
D	2.85	2.90	2.95
E	1.25	1.30	1.35
E1	2.35	2.40	2.45
e	1.85	1.90	1.95
L	0.35	0.40	0.48
θ	0°	-	6°