

40V 200mA Low Current Consumption Regulator

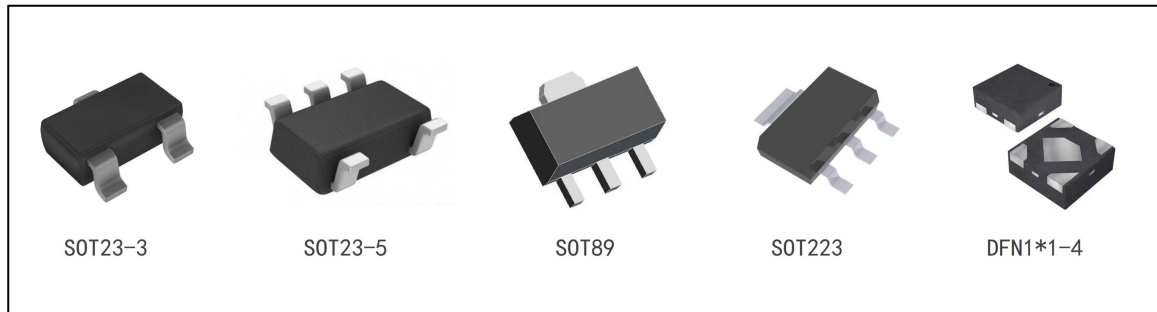
H75HXX

General Description

The H75HXX is ultra-low quiescent current regulator features low dropout voltage and low current in the standby mode. With 1.5 μ A(typical) quiescent current at no load, the H75HXX is ideally suited for standby micro-control-unit systems, especially for always-on applications like E-meters, fire alarms, smoke detectors and other battery-operated systems. The H75HXX retains all of the features that are common to low dropout regulators including a low dropout PMOS pass device, short circuit protection, and thermal shutdown.

The H75HXX has 40V maximum operating voltage limit, and -30°C to 80°C operating temperature range, and $\pm 2\%$ output voltage tolerance over the entire output current, input voltage, and temperature range.

The H75HXX regulators are available in standard SOT23-3, SOT23-5, SOT89, SOT223 and DFN1*1-4 packages.



Features

- Vin Range up to 40V
- Output range: 1.5V ~ 5.0V
- Maximum output current: 250mA
- PSRR: 80dB @1KHz
- Dropout voltage: 400mV @ IO_{UT}=100mA
- Ultra low quiescent current: 1.5 μ A Typ.
- Output voltage tolerances of $\pm 2\%$ Over the temperature range
- Internal thermal overload protection
- Built-in Short-Circuit Protection, Current Limiter

Order Information

Device	Package	Manner of Packing	Devices per bag/reel
H75HXXMR	SOT23-3	Reel	3000PCS/reel
H75HXXM5R	SOT23-5	Reel	3000PCS/reel
H75HXXPR	SOT89	Reel	1000PCS/reel
H75HXXPBR	SOT89B	Reel	1000PCS/reel
H75HXXFR	SOT223	Reel	2500PCS/reel
H75HXXFBR	SOT223B	Reel	2500PCS/reel
H75HXXDFR	DFN1*1-4	Reel	10000PCS/reel

Note: “XX” stands for output voltages.

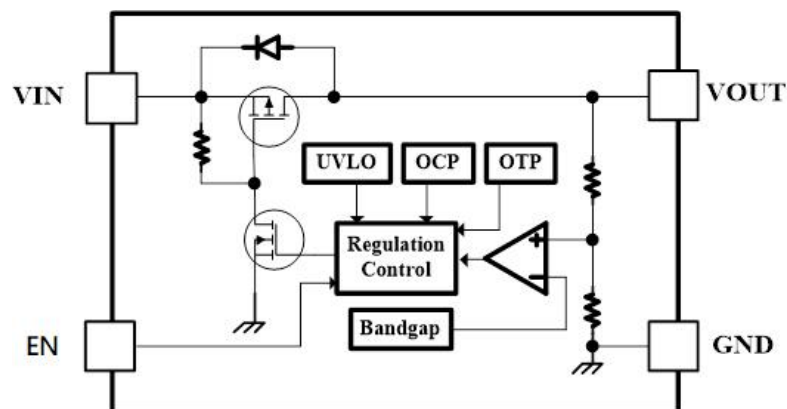
Selection Table

H75H①②③④⑤

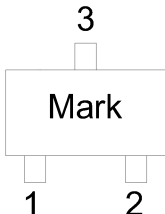
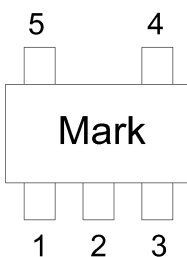
Designator	Symbol	Description
①②	Integer	Output Voltage(1.5~5.0V)
③④	M	Package: SOT23-3
	M5	Package: SOT23-5
	P	Package: SOT89
	PB	Package: SOT89B
	F	Package: SOT223
	FB	Package: SOT223B
	DF	Package: DFN1*1-4
⑤	R	Halogen Free

Note: “①②” stands for output voltages. The regular output voltage is 2.5V, 3.0V, 3.3V, 3.6V, 4.0V, 5.0V. Other voltages can be specially customized.

Block Diagram and Pin Arrangement Diagram



Pin Assignment

SOT23-3 (Top View) 	Table1: H75HxxMr series (SOT23-3 PKG) <table><tr><th>PIN NO.</th><th>PIN NAME</th><th>FUNCTION</th></tr><tr><td>1</td><td>GND</td><td>GND pin</td></tr><tr><td>2</td><td>VOUT</td><td>Output voltage pin</td></tr><tr><td>3</td><td>VIN</td><td>Input voltage pin</td></tr></table>	PIN NO.	PIN NAME	FUNCTION	1	GND	GND pin	2	VOUT	Output voltage pin	3	VIN	Input voltage pin												
PIN NO.	PIN NAME	FUNCTION																							
1	GND	GND pin																							
2	VOUT	Output voltage pin																							
3	VIN	Input voltage pin																							
SOT23-5 (Top View) 	Table2: H75HxxM5R series (SOT23-5 PKG) <table><tr><th>PIN NO.</th><th>PIN NAME</th><th>FUNCTION</th></tr><tr><td>1</td><td>VIN</td><td>Input voltage pin</td></tr><tr><td>2</td><td>GND</td><td>GND pin</td></tr><tr><td>3</td><td>EN</td><td>Enable</td></tr><tr><td>4</td><td>NC</td><td>Not connected</td></tr><tr><td>5</td><td>VOUT</td><td>Output voltage pin</td></tr></table>	PIN NO.	PIN NAME	FUNCTION	1	VIN	Input voltage pin	2	GND	GND pin	3	EN	Enable	4	NC	Not connected	5	VOUT	Output voltage pin						
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1	VIN	Input voltage pin																							
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3	EN	Enable																							
4	NC	Not connected																							
5	VOUT	Output voltage pin																							
SOT89 (Top View) 	Table3: H75HxxPR series (SOT89 PKG) <table><tr><th>PIN NO.</th><th>PIN NAME</th><th>FUNCTION</th></tr><tr><td>1</td><td>GND</td><td>GND pin</td></tr><tr><td>2</td><td>VIN</td><td>Input voltage pin</td></tr><tr><td>3</td><td>VOUT</td><td>Output voltage pin</td></tr></table> Table4: H75HxxPBR series (SOT89B PKG) <table><tr><th>PIN NO.</th><th>PIN NAME</th><th>FUNCTION</th></tr><tr><td>1</td><td>VIN</td><td>Input voltage pin</td></tr><tr><td>2</td><td>GND</td><td>GND pin</td></tr><tr><td>3</td><td>VOUT</td><td>Output voltage pin</td></tr></table>	PIN NO.	PIN NAME	FUNCTION	1	GND	GND pin	2	VIN	Input voltage pin	3	VOUT	Output voltage pin	PIN NO.	PIN NAME	FUNCTION	1	VIN	Input voltage pin	2	GND	GND pin	3	VOUT	Output voltage pin
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SOT223 (Top View) 	Table5: H75HxxFR series (SOT223 PKG) <table><tr><th>PIN NO.</th><th>PIN NAME</th><th>FUNCTION</th></tr><tr><td>1</td><td>GND</td><td>GND pin</td></tr><tr><td>2</td><td>VIN</td><td>Input voltage pin</td></tr><tr><td>3</td><td>VOUT</td><td>Output voltage pin</td></tr></table> Table6: H75HxxFBR series (SOT223B PKG) <table><tr><th>PIN NO.</th><th>PIN NAME</th><th>FUNCTION</th></tr><tr><td>1</td><td>VIN</td><td>Input voltage pin</td></tr><tr><td>2</td><td>GND</td><td>GND pin</td></tr><tr><td>3</td><td>VOUT</td><td>Output voltage pin</td></tr></table>	PIN NO.	PIN NAME	FUNCTION	1	GND	GND pin	2	VIN	Input voltage pin	3	VOUT	Output voltage pin	PIN NO.	PIN NAME	FUNCTION	1	VIN	Input voltage pin	2	GND	GND pin	3	VOUT	Output voltage pin
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2	GND	GND pin																							
3	VOUT	Output voltage pin																							

DFN1*1-4(Top View)

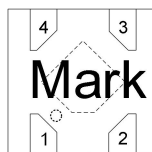


Table7: H75HxxDFR series (DFN1*1-4 PKG)

PIN NO.	PIN NAME	FUNCTION
1	VOUT	Output voltage pin
2	GND	GND pin
3	EN	Enable
4	VIN	Input voltage pin

Absolute Maximum Ratings

Parameter	Value	Unit
Input Voltage	-0.3~45	V
$V_{EN}^{(1)}$	-0.3V~30	V
V_{OUT}	-0.3V~7	V
Storage Temperature	-65~150	°C
Lead Temperature(Soldering, 10 sec.).	300	°C
Junction Temperature	-40~125	°C
Operating Temperature	-30~80	°C

Note: These are stress ratings only. Stresses exceeding the range specified under “Absolute Maximum Ratings” may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

(1) EN pin can connect 100K resistor to VIN.

Electrical Characteristics

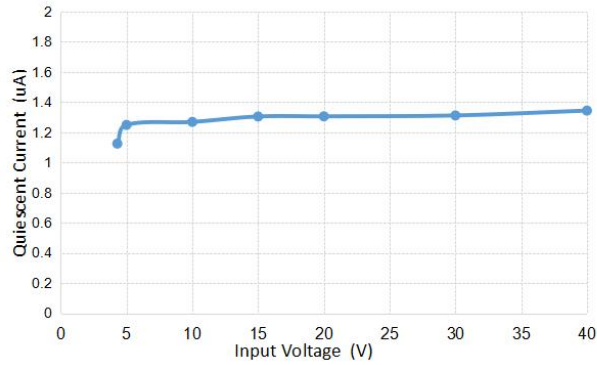
The following specifications apply for $V_{IN}=12V$, $I_{OUT}=1mA$, $C_{IN}=C_{OUT}=1\mu F$, $T_J=25^{\circ}C$, unless otherwise noted.

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input Voltage	V_{IN}		2.7	---	40	V
Output Range	V_{OUT}		1.5	---	5.5	V
Output Voltage Accuracy	ΔV_{OUT}		-2	V_{OUT}	2	%
Quiescent Current	I_Q	$T_J=25^{\circ}C$	---	1.5	2.5	μA
Current Limit	I_{LIMIT}		270	320	---	mA
Dropout Voltage	V_{DROP}	$I_{OUT}=100mA$	---	400	---	mV
		$I_{OUT}=200mA$	---	1200	---	mV
Line Regulation	ΔV_{LINE}	$V_{IN}=V_{OUT}+1V$ to 40V, or $V_{IN}=5V$ to 40V, if $V_{OUT}<4V$	---	2	10	mV
Load Regulation	ΔV_{LOAD}	$I_{OUT}=1mA$ to 100mA	---	0.25	---	%
		$I_{OUT}=1mA$ to 200mA	---	1	---	
Power Supply Rejection Rate	PSRR	F=1KHz	---	80	---	dB
		F=10KHz	---	60	---	
EN logic high voltage	V_{ENH}		1.2	---	---	V
EN logic low voltage	V_{ENL}		---	---	0.4	V
Thermal Shutdown	T_{SD}		---	140	---	$^{\circ}C$
Thermal Shutdown Hysteresis	T_{HY}		---	20	---	$^{\circ}C$

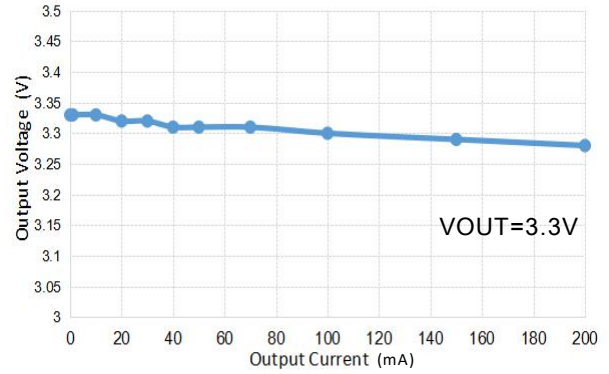
Typical Performance Characteristics

$C_{IN}=1\mu F$, $C_{OUT}=1\mu F$, $V_{IN}=5.3V$, $V_{OUT}=3.3V$ $T_J=25^\circ C$, unless specified otherwise

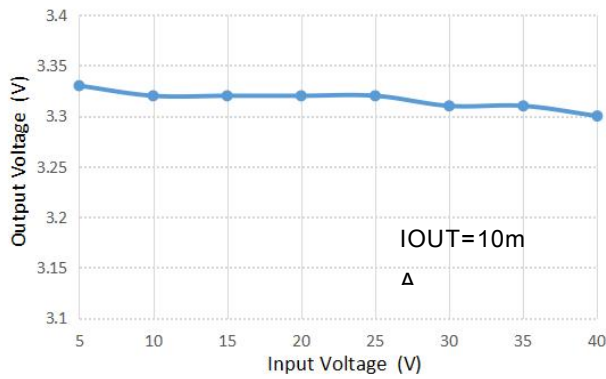
(1) Quiescent Current VS Input Voltage



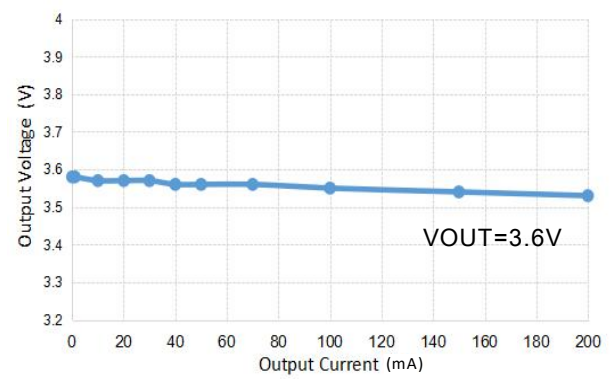
(2) Output Voltage VS Output Current



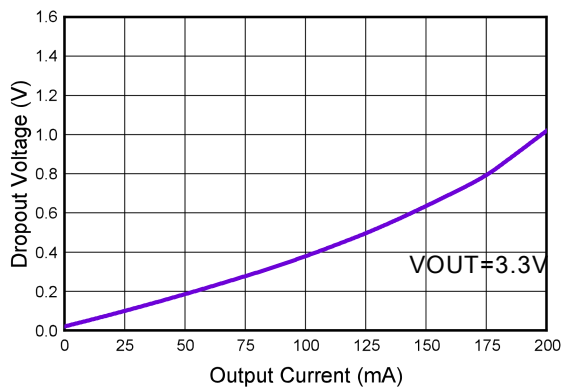
(3) Output Voltage VS Input Voltage



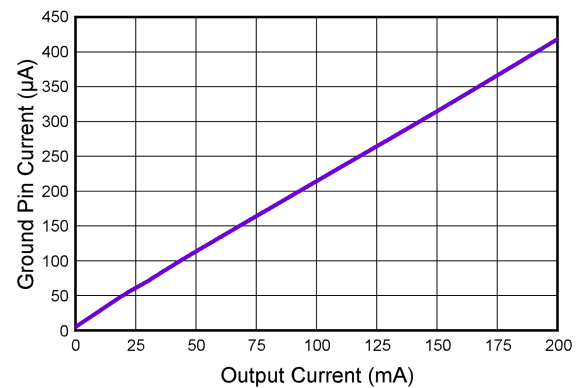
(4) Output Voltage VS Output Current



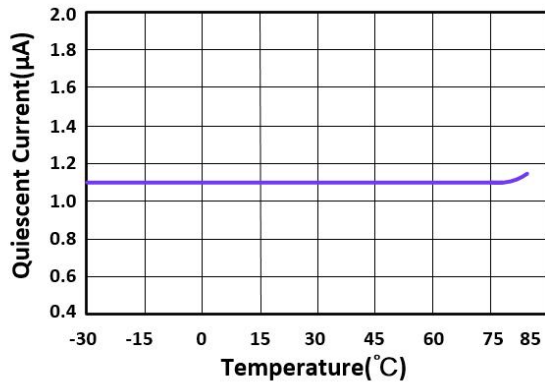
(5) Dropout Voltage VS Output Current



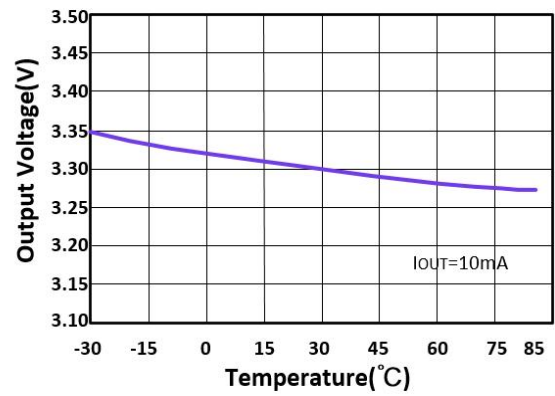
(6) Ground Pin Current VS Output Current



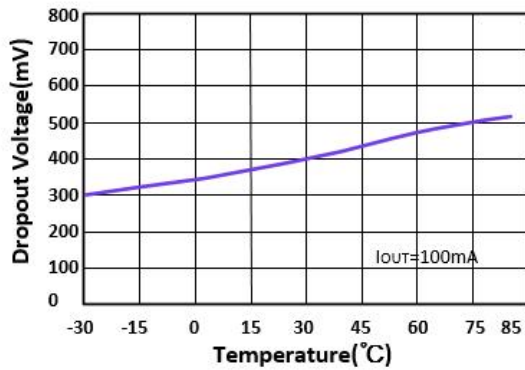
(7) Quiescent Current VS Temperature



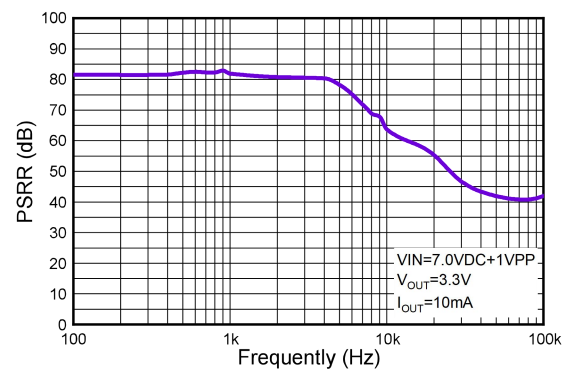
(8) Output Voltage VS Temperature



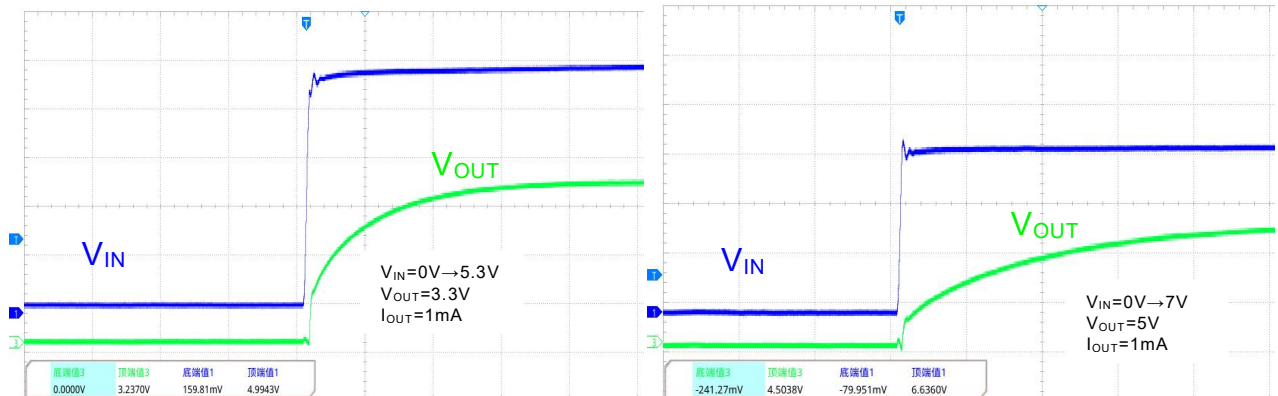
(9) Dropout Voltage VS Temperature



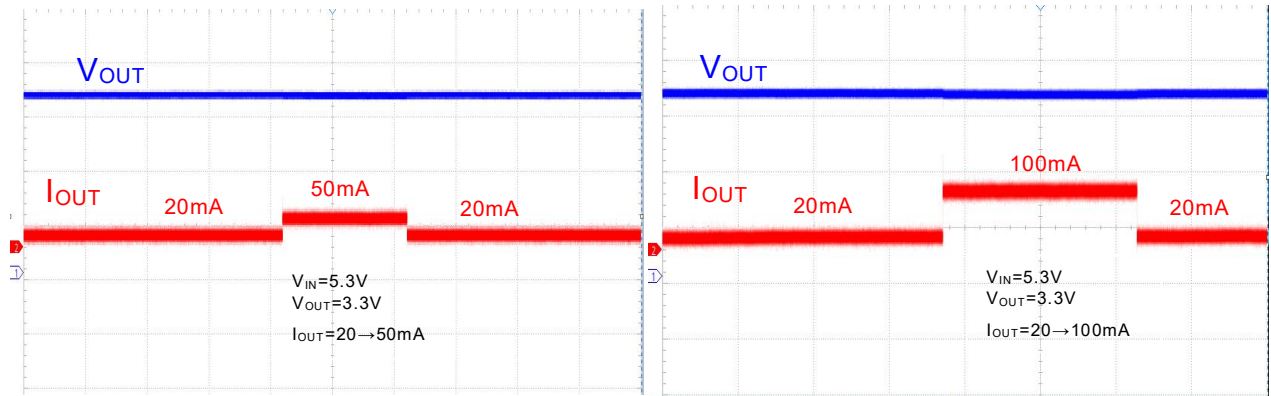
(10) PSRR VS Frequency



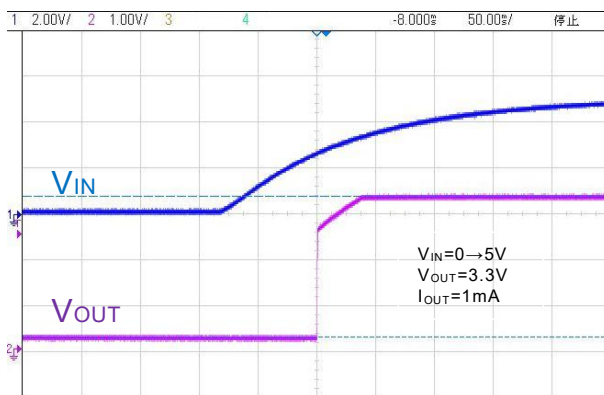
(11) Input Transient Response



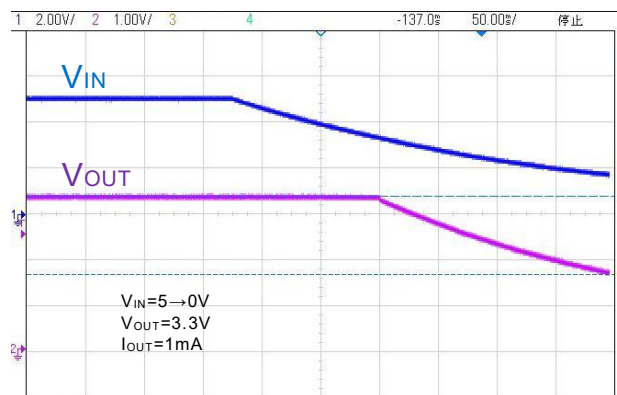
(12) Load Transient Response



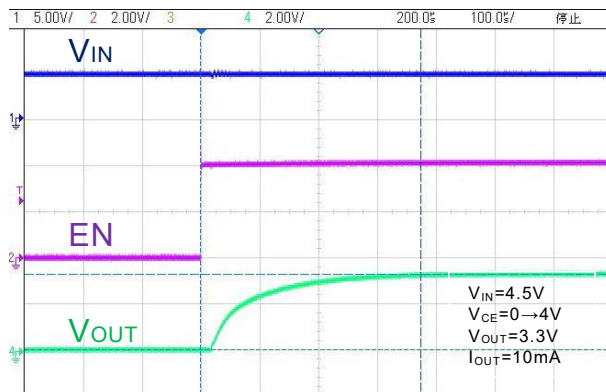
(13) Power ON



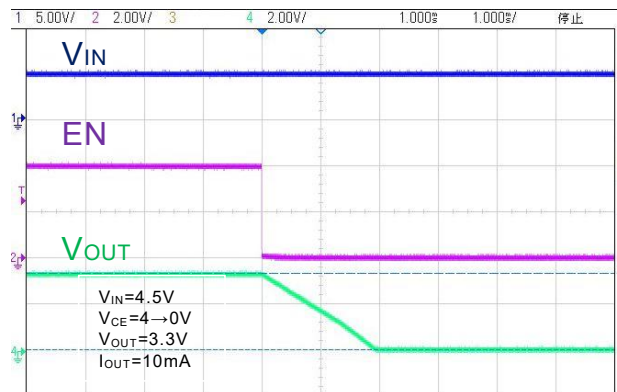
(14) Power OFF



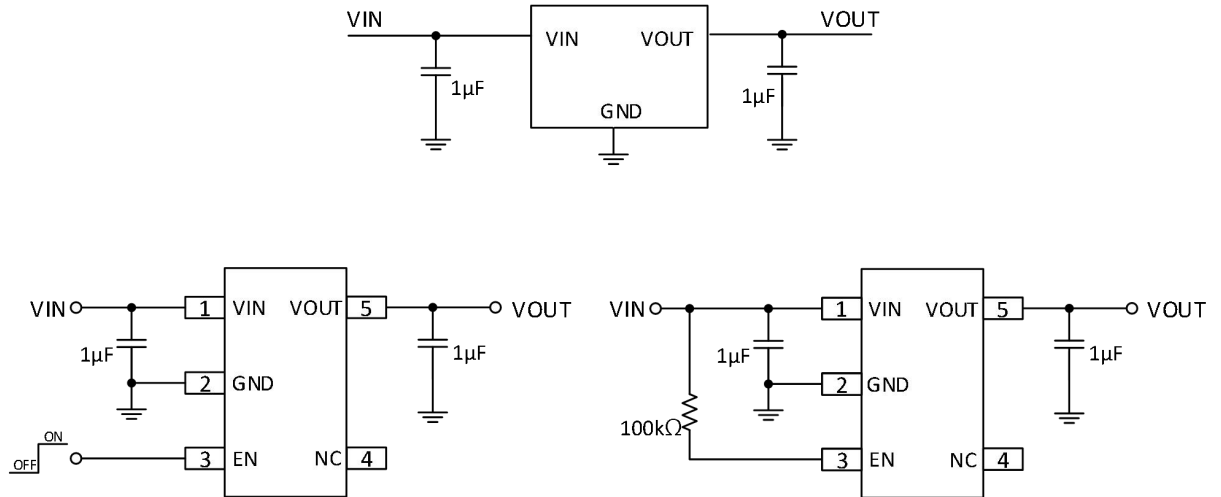
(15) EN ON



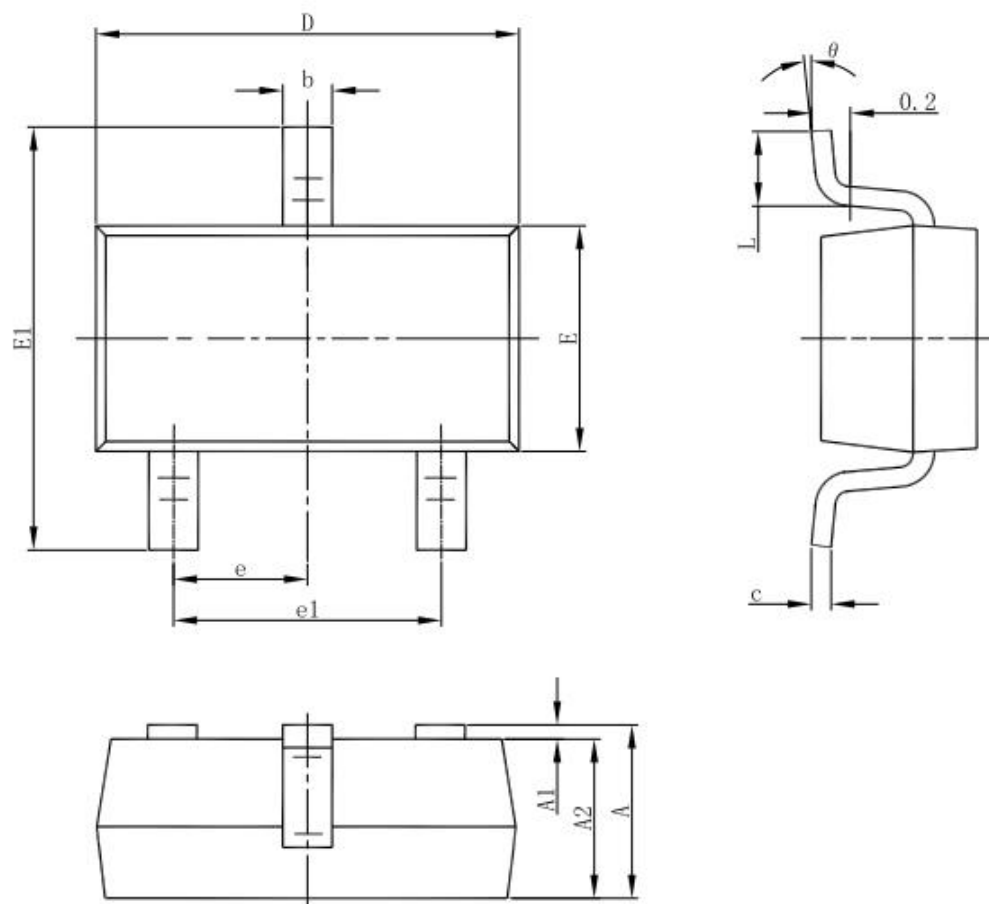
(16) EN OFF



Application Circuits

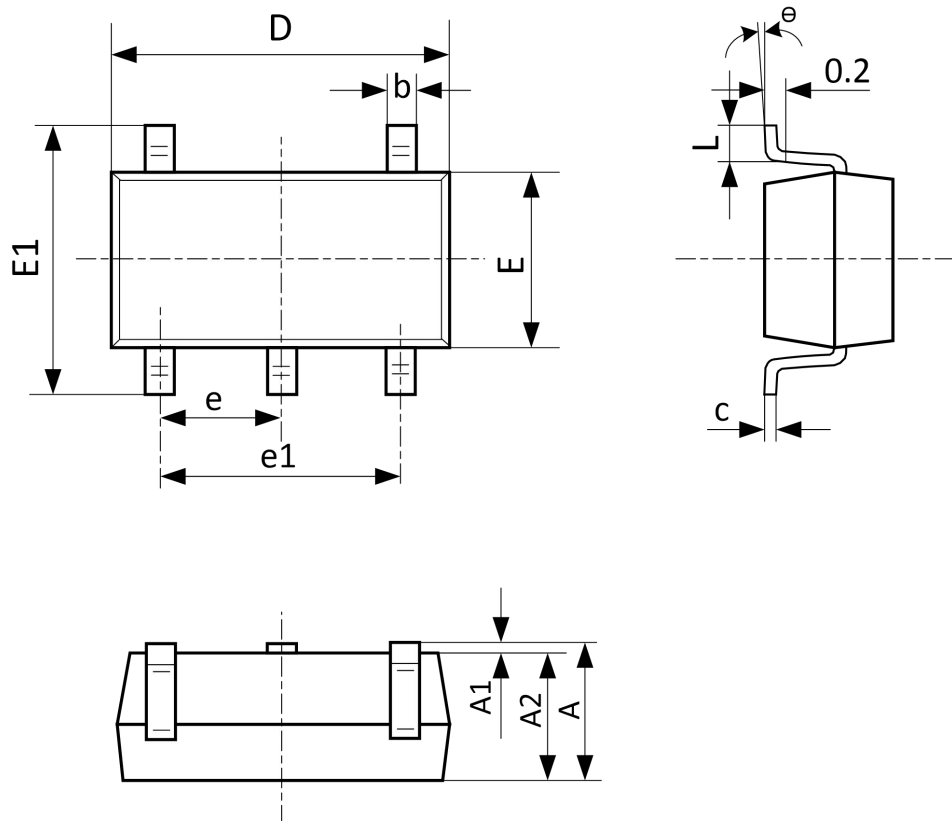


Package Information (SOT23-3)



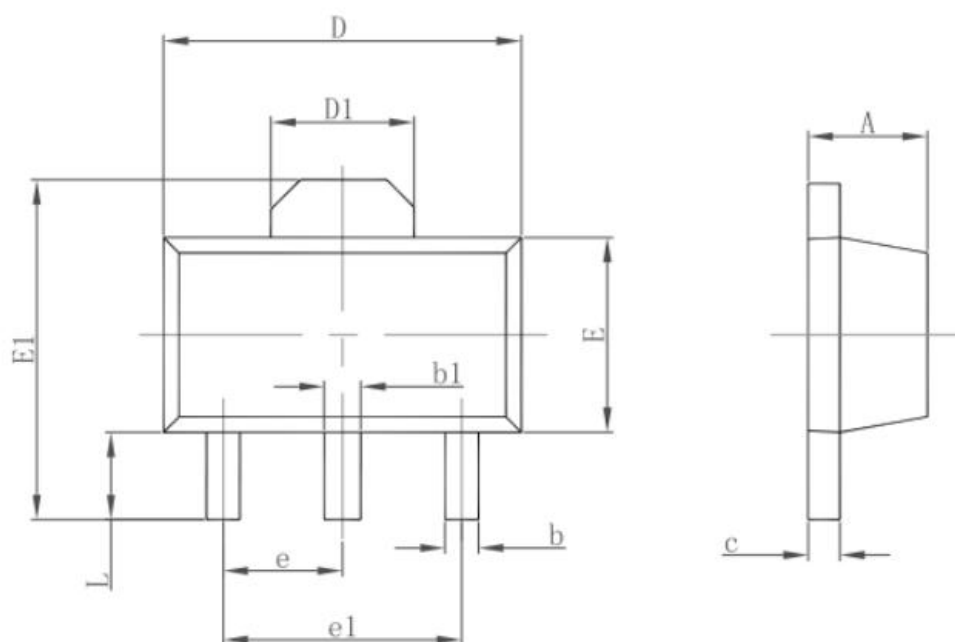
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

Package Information (SOT23-5)



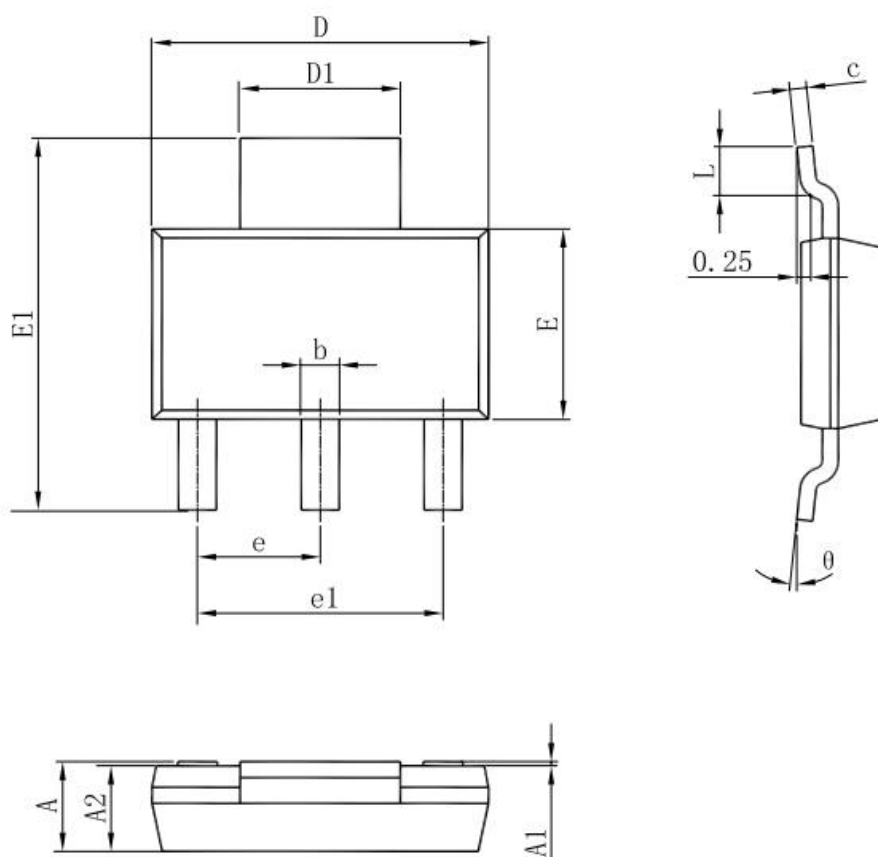
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

Package Information (SOT89-3L)



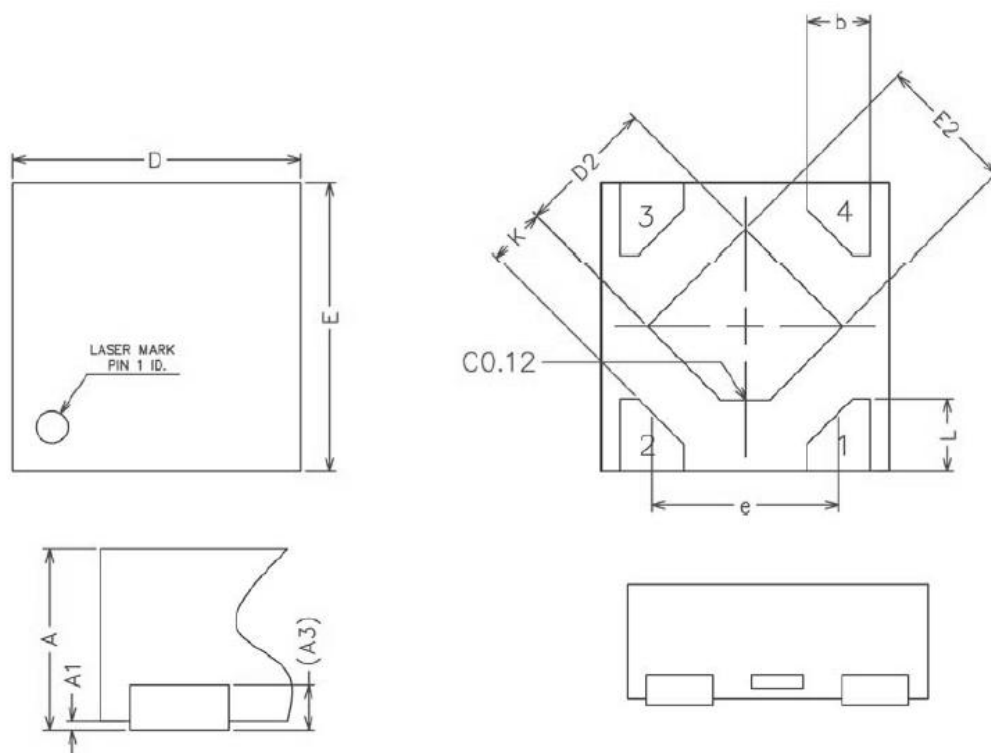
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047

Package Information (SOT223)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.520	1.800	0.060	0.071
A1	0.000	0.100	0.000	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.820	0.026	0.032
c	0.250	0.350	0.010	0.014
D	6.200	6.400	0.244	0.252
D1	2.900	3.100	0.114	0.122
E	3.300	3.700	0.130	0.146
E1	6.830	7.070	0.269	0.278
e	2.300(BSC)		0.091(BSC)	
e1	4.500	4.700	0.177	0.185
L	0.900	1.150	0.035	0.045
θ	0°	10°	0°	10°

Package Information (DFN1*1-4)



Symbol	Min.	NOM	Max.
A	0.34	0.37	0.40
A1	0.00	0.02	0.05
A3	0.100REF		
b	0.17	0.22	0.27
D	0.95	1.00	1.05
E	0.95	1.00	1.05
D2	0.43	0.48	0.53
E2	0.43	0.48	0.53
L	0.20	0.25	0.30
e	-	0.65	-
K	0.15	-	-

Special Instructions

The company reserves the right of final interpretation of this specification.

Version Change Description

Version: V1.0

Author: Yang

Time: 2022.12.09

Modify the record:

1. Editio princeps

Statement

The information in the usage specification is correct at the time of publication, Shanghai Siproin Microelectronics Co. has the right to change and interpret the specification, and reserves the right to modify the product without prior notice. Users can obtain the latest version information from our official website or other effective channels before confirmation, and verify whether the relevant information is complete and up to date.

With any semiconductor product, there is a certain possibility of failure or failure under certain conditions. The buyer is responsible for complying with safety standards and taking safety measures when using the product for system design and complete machine manufacturing. The product is not authorized to be used as a critical component in life-saving or life-sustaining products or systems, in order to avoid potential failure risks that may cause personal injury or property loss.