

GENERAL DESCRIPTION

ASPL1600 series is a group of positive voltage output 3-terminal linear regulator, capable of delivering 300mA current and working under 16V input voltage. It also features extremely low standby current which is only 3uA, while still keeps very fast load transient response capability. With the extremely low 3uA standby current, ASPL1600 can greatly improve natural life of batteries. Besides, it also provides fold back short-circuit protection (SCP), over-temperature protection (OTP) and output current limit function.

ASPL1600 includes high accuracy voltage reference, error amplifier, and current limit circuit and output driver module. ASPL1600 has well load transient response and good temperature characteristic, And it uses trimming technique to guarantee output voltage accuracy within $\pm 2\%$. ASPL1600 can provide output value in the range of 1.1V~5.0V in 0.1V steps. It also can customized on command.

ASPL1600 is housed in 3 different types of packages, which are SOT23-5, SOT23-3 and SOT89-3.

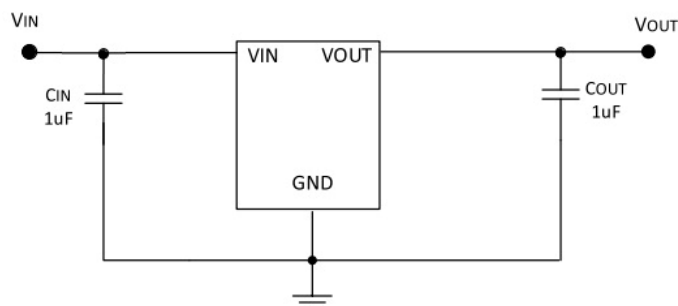
FEATURES

- Low Power Consumption: 3.0uA (Typ.)
- Maximum Output Current: 300mA
- Small Dropout Voltage
 - 200mV@100mA ($V_{OUT}=3.3V$)
 - 400mV@200mA ($V_{OUT}=3.3V$)
- Input Voltage Range: 2V~16V
- Output Voltage Range: 1.1V~5.0V (customized on command in 0.1V steps)
- Highly Accurate: $\pm 2\%$ ($\pm 1\%$ customized)
- Output Current Limit 330mA@ $V_{OUT} = 3.3V$
- Fold back Short - circuit Current 56mA@ $V_{out}=3.3V$

APPLICATIONS

- Wearables
- Toys
- Smart Home Application
- Battery Powered equipment

TYPICAL APPLICATION

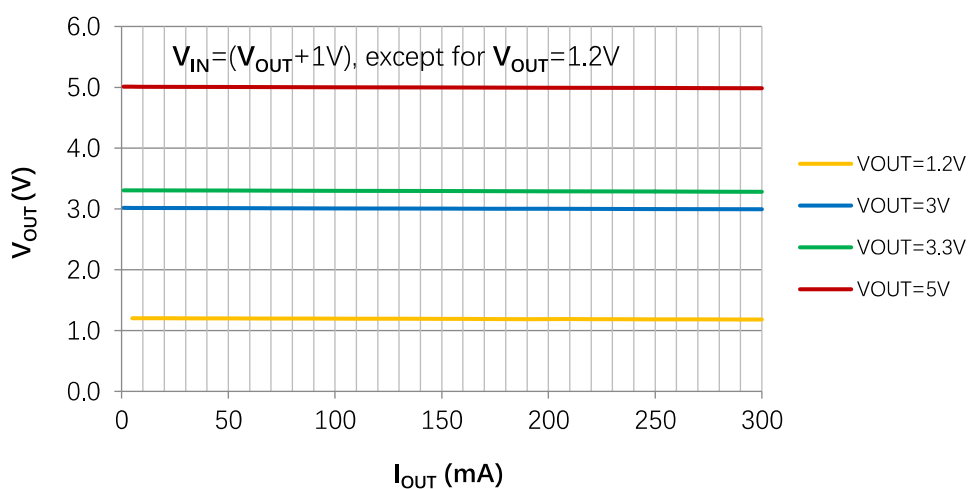


Note:

1) Input capacitor ($C_{IN}=1\mu F$) and Output capacitor ($C_{OUT}=1\mu F$) are recommended in all application circuit.

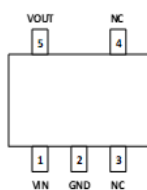
TYPICAL ELECTRICAL CHARACTERISTICS

V_{OUT} vs. I_{OUT}

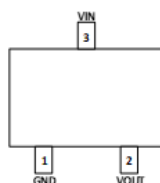


PING ASSIGNMENT

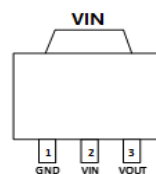
SOT23-5



SOT23-3



SOT89-3



ORDER INFORMATION

Ordering Device No.	Package	Packing	Quantity
ASPL1600-XXZB-R	SOT23-3	Tape&Reel	3000/Reel
ASPL1600-XXZD-R	SOT23-5	Tape&Reel	3000/Reel
ASPL1600-XXDI-R	SOT89-3	Tape&Reel	1000/Reel

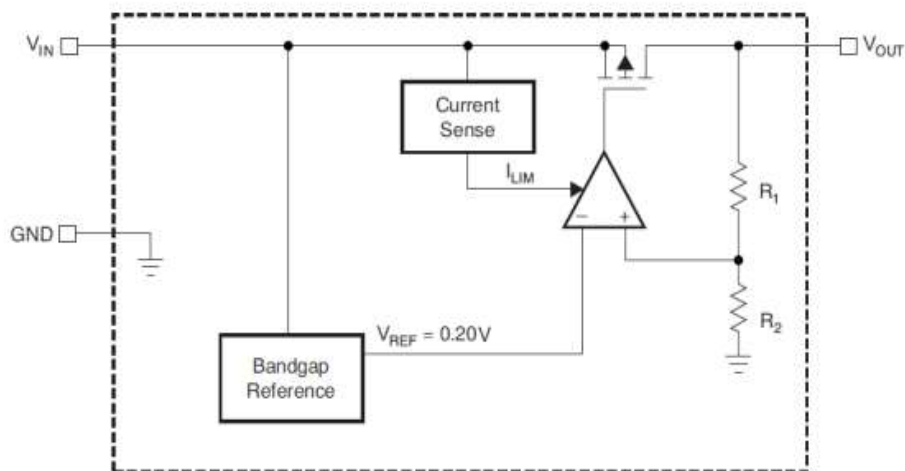
Note: "XX" stands for Output Voltage. "12": 1.2V, "15": 1.5V, "18": 1.8V, "25": 2.5V, "28": 2.8V, "30": 3.0V, "33": 3.3V, "36": 3.6V, "40": 4.0V, "45": 4.5V, "50": 5.0V.

Note: "ZB, ZD, DI" stands for package. "ZB": SOT23-3, "ZD": SOT23-5, "DI": SOT89-3.

Note: "R" stands for Packing, Tape&Reel.

P/N example: ASPL1600-18ZD-R, ASPL1600-25ZB-R, ASPL1600-25DI-R, etc.

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

(Note: Exceeding or exposure to these absolute rating limits may damage the device permanently or affect its reliability)

Max Input Voltage	-0.3V to 18V
Operating Junction Temperature(Tj).....	125°C
Output Current	300mA
Operating Temperature Range	-40°C to 85°C
Storage Temperature Range	-55°C to 150°C
ESD Human body mode	2KV
Thermal Resistance	θ_{JA} θ_{JC}
SOT23-5	165.....75..... °C/W
SOT23-3	191.....85..... °C/W
SOT89-3	52.....25..... °C/W
Lead Temperature & Time	260°C,10S

ELECTRICAL CHARACTERISTICS

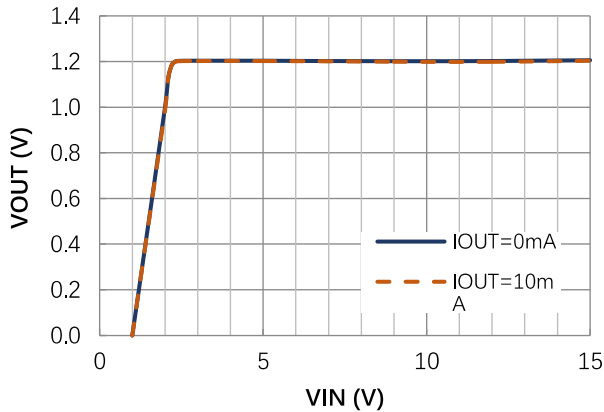
 (Test Conditions: $C_{in}=1\mu F$, $C_{out}=1\mu F$, $T_A=25^{\circ}C$, unless otherwise noted)

Symbol.	Description	Condition		Min	Typ	Max	Unit
V_{IN}	Input Voltage					16	V
V_{OUT}	Output Voltage	$V_{in}=V_{out}+1V$ for 2% accuracy		V_{OUT} $\times 0.98$		V_{OUT} $\times 1.02$	V
		$V_{in}=V_{out}+1V$ for 1% accuracy		V_{OUT} $\times 0.99$		V_{OUT} $\times 1.01$	V
$I_{OUT} (Max.)$	Maximum Output Current	$V_{IN}-V_{OUT}=2V$		300			mA
$V_{DROPOUT}$	Input-Output Voltage Differential	$I_{OUT}=100mA$	$V_{out}<1.8V$		1200	1500	mV
			$V_{out}\geq 1.8V$		300	600	mV
$\frac{\Delta V_{OUT}}{\Delta V_{IN} * V_{OUT}}$	Line Regulation	$I_{OUT}=10mA$ $4V\leq V_{IN}\leq 16V$			0.1	0.3	%/V
ΔV_{OUT}	Load Regulation	$V_{IN}=V_{OUT}+1V$ $1mA\leq I_{OUT}\leq 100mA$			8	20	mV
I_{DD}	Supply Current	$V_{IN}=V_{OUT}+1V$			3	6	μA
I_{SHORT}	Short-circuit Current	$V_{IN} = V_{OUT}+2V$			60	120	mA

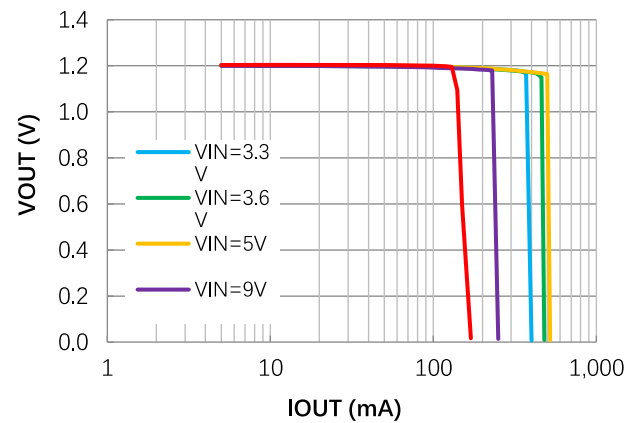
TYPICAL CHARACTERISTICS

Test conditions: $C_{in}=C_{out}=1\mu F$, all typical values are at $T_A=25^\circ C$ (unless otherwise noted)

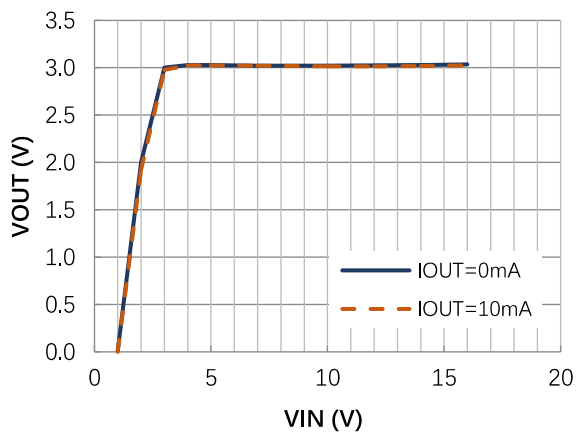
Line Regulation ($V_{OUT}=1.2V$)



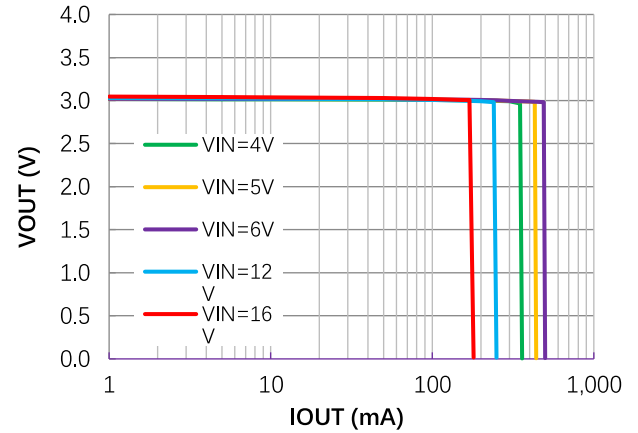
Load Regulation ($V_{OUT}=1.2V$)



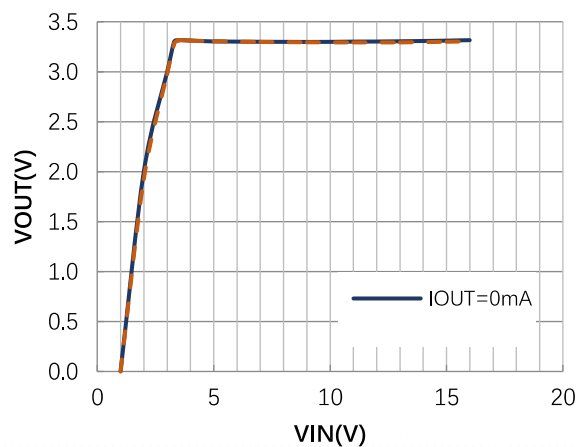
Line Regulation ($V_{OUT}=3V$)



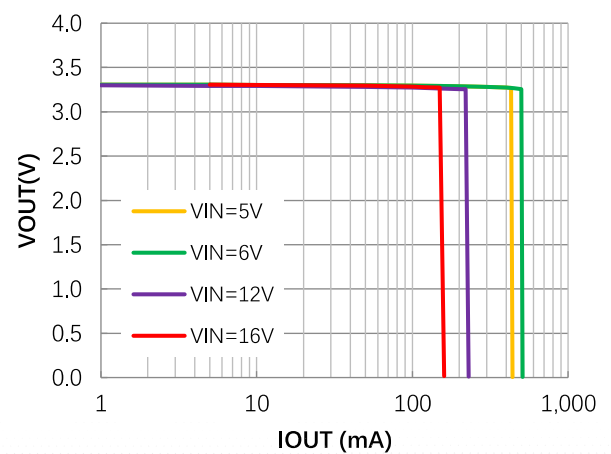
Load Regulation ($V_{OUT}=3V$)



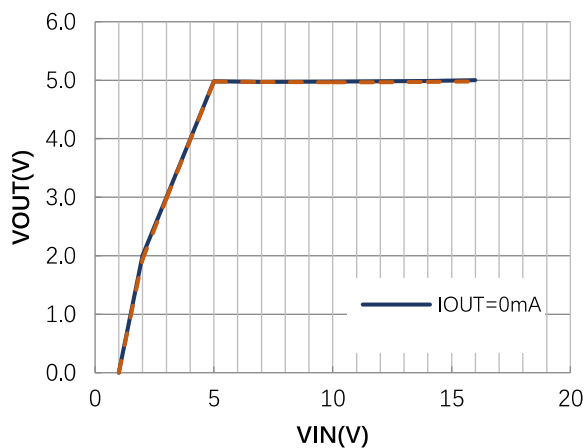
Line Regulation ($V_{OUT}=3.3V$)



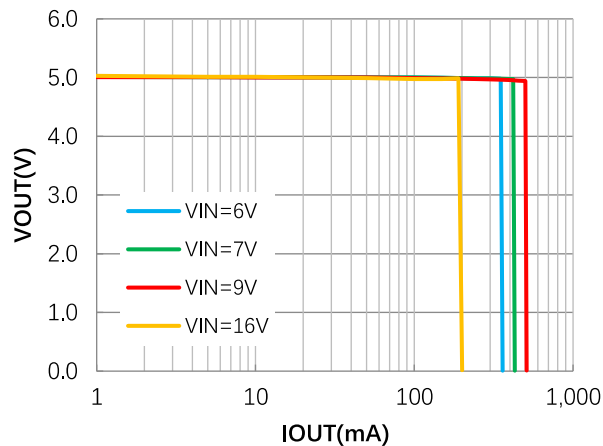
Load Regulation ($V_{OUT}=3.3V$)



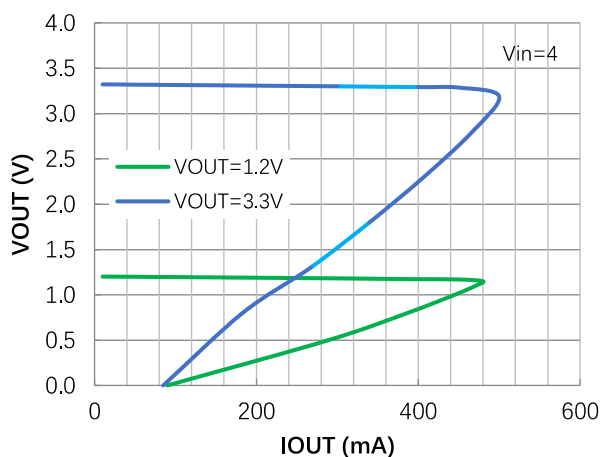
Line Regulation ($V_{OUT}=5V$)



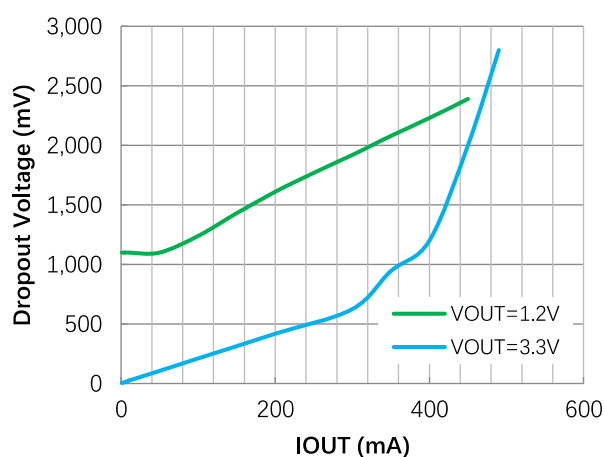
Load Regulation ($V_{OUT}=5V$)



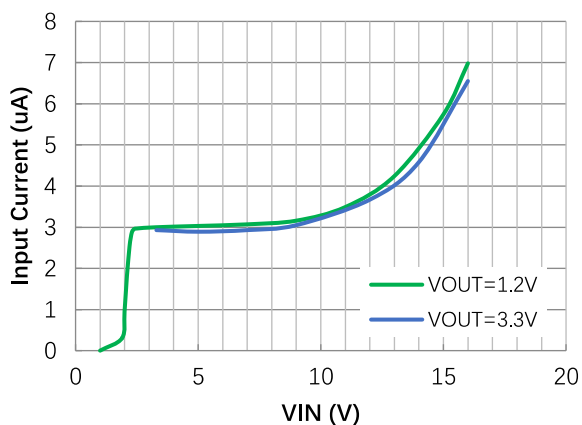
Current Limit



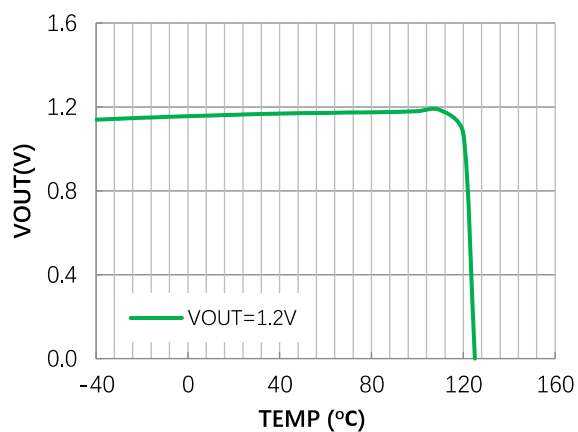
Dropout Voltage vs. I_{OUT}



Standby Current ($I_{OUT}=0A$)

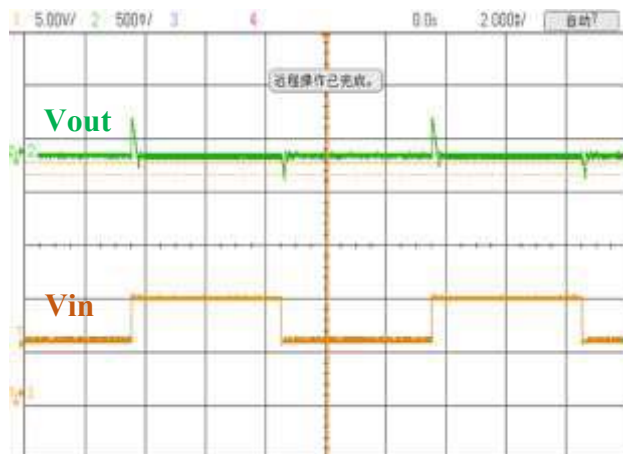


Output Voltage vs. Ambient Temperature

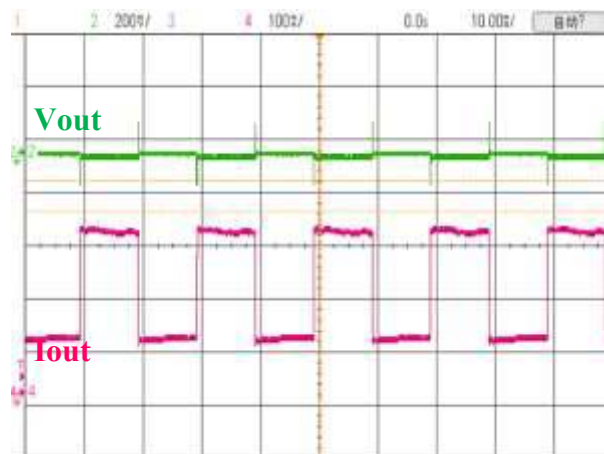


16V 300mA Fast Response LDO with only 3uA Iq

Line Transient Response

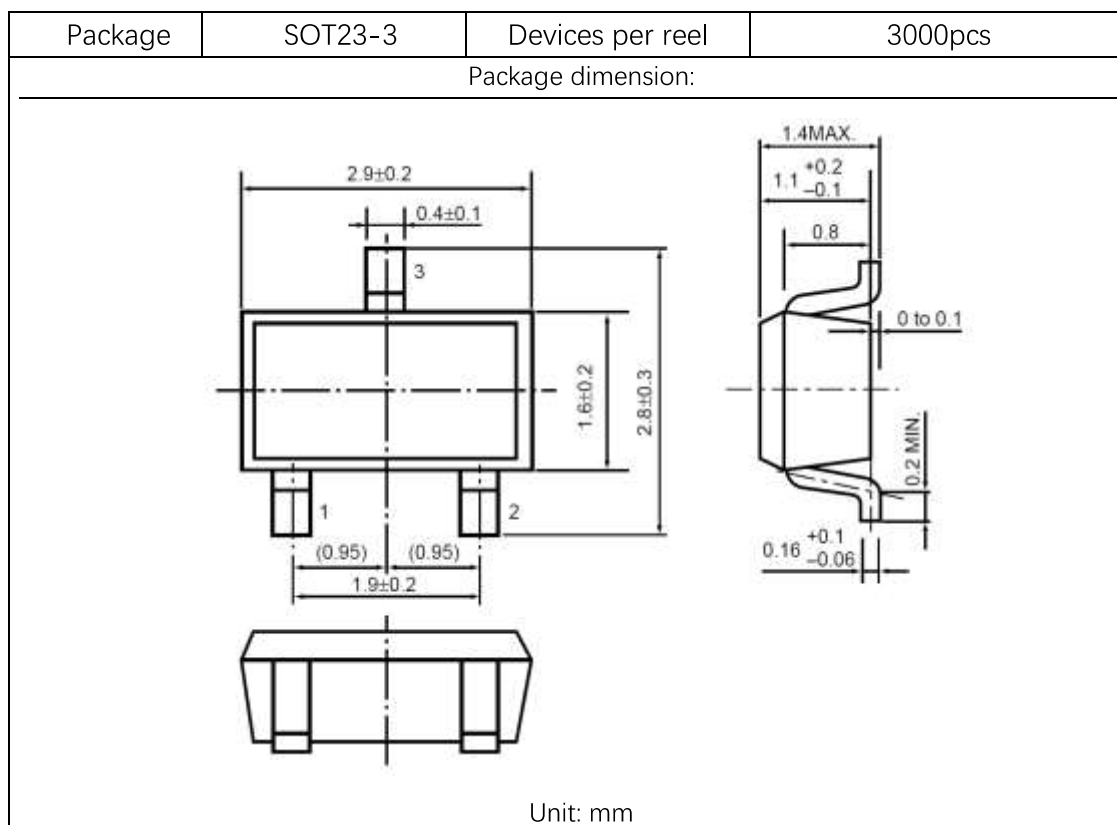
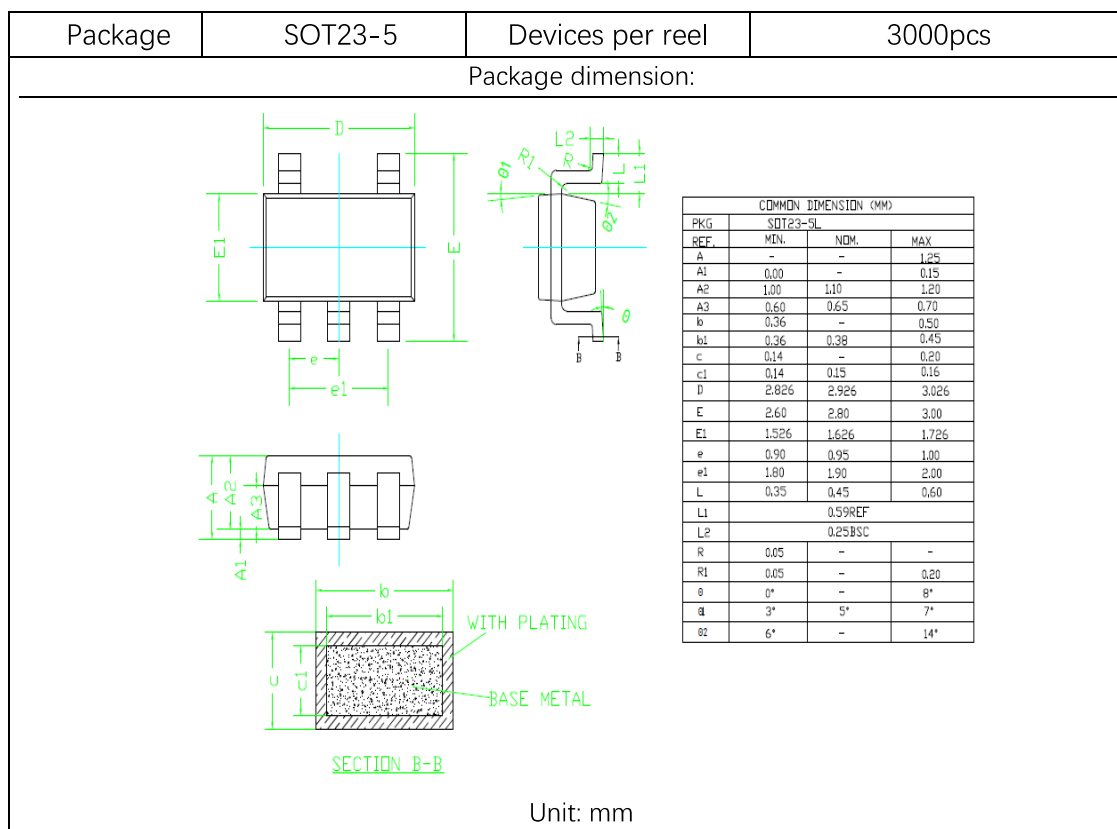


Load Transient Response

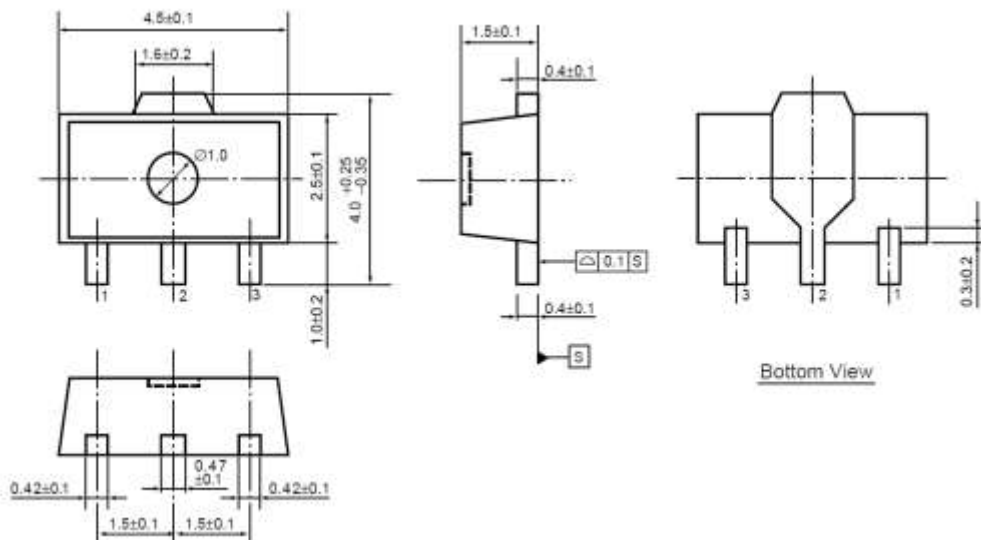


16V 300mA Fast Response LDO with only 3uA Iq

PACKAGE OUTLINE



16V 300mA Fast Response LDO with only 3uA Iq

Package	SOT89-3	Devices per reel	1000pcs
Package dimension:			
 Unit: mm			

IMPORTANT NOTICE

ShenZhen Ascend Semiconductor incorporated MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A

PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

ShenZhen Ascend Semiconductor Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. ShenZhen Ascend Semiconductor Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does ShenZhen Ascend Semiconductor Incorporated convey any license under its patent or trademark rights,

nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume .

all risks of such use and will agree to hold Ascendsemi Incorporated and all the companies whose products are represented on ShenZhen Ascend Semiconductor Incorporated website, harmless against all damages.

ShenZhen Ascend Semiconductor Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel. Should Customers purchase or use ShenZhen Ascend Semiconductor Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold ShenZhen Ascend Semiconductor Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

www.ascendsemi.com