

Features

- Low power consumption
- Low voltage drop
- Low temperature coefficient
- High input voltage (up to 15V)
- High output current : 250mA
- Output voltage accuracy: tolerance $\pm 2\%$
- TO92, SOT89 and SOT23-5 package

Applications

- Battery-powered equipment
- Communication equipment
- Audio/Video equipment

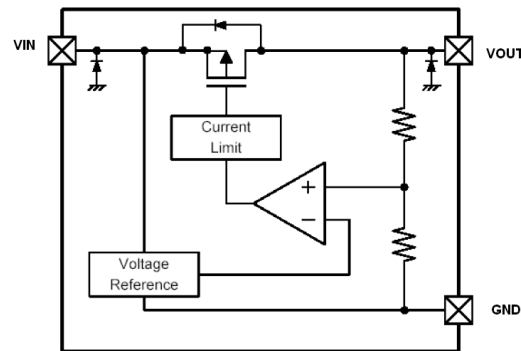
General Description

The ASPL73XX series is a set of three-terminal high current low voltage regulator implemented in CMOS technology. They can deliver 250mA output current and allow an input voltage as high as 15V. They are available with several fixed output voltages ranging 2.5V to 5.0V. CMOS technology ensures low voltage drop and low quiescent current.

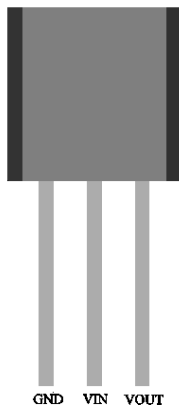
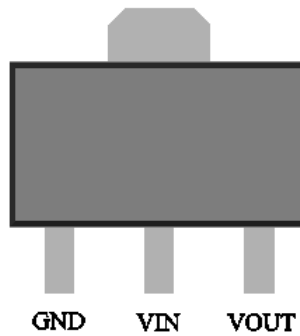
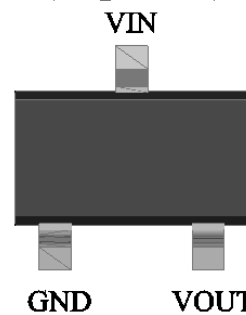
Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain variable voltages and currents.

Selection Table

Part No.	Output Voltage	Package
ASPL7325	2.5V	TO92 SOT89 SOT23-3 SOT23
ASPL7328	2.8V	
ASPL7330	3.0V	
ASPL7333	3.3V	
ASPL7336	3.6V	
ASPL7340	4.0V	
ASPL7344	4.4V	
ASPL7350	5.0V	

**Block Diagram**

*Diodes inside the circuit are an ESD protection diode and a parasitic diode.

Pin Assignment**TO92 (Front view)****SOT89 (Top view)****SOT23-3 and SOT23
(Top view)****Absolute Maximum Ratings**

Supply Voltage-0.3V to 18V Storage Temperature-50°C to 125°C
Operating Temperature-30°C to 85°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.

Thermal Information

Symbol	Parameter	Package	Max.	Unit
θ_{JA}	Thermal Resistance (Junction to Ambient) (Assume no ambient airflow, no heat sink)	SOT23	500	°C/W
		SOT89	200	°C/W
		TO92	200	°C/W
P_D	Power Dissipation	SOT23	0.20	W
		SOT89	0.50	W
		TO92	0.50	W

Note: P_D is measured at $T_a = 25^\circ\text{C}$

**Electrical Characteristics****ASPL7325, +2.5V Output Type**

Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
V _{OUT}	Output Voltage	4.5V	I _{OUT} =40mA	2.45	2.500	2.55	V
I _{OUT}	Output Current	4.5V	-	-	250	-	mA
ΔV _{OUT}	Load Regulation	4.5V	1mA ≤ I _{OUT} ≤ 60mA	-	45	90	mV
V _{DIF}	Voltage Drop(Note)	-	I _{OUT} =40mA, ΔV _{OUT} =2%	-	100	-	mV
I _{SS}	Current Consumption	4.5V	No load	-	2.0	3.0	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	-	3.5V ≤ V _{IN} ≤ 12V I _{OUT} =40mA	-	0.2	-	%/V
V _{IN}	Input Voltage	-	-	-	-	15	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	4.5V	I _{OUT} =40mA -40°C < Ta < 85°C	-	±0.5	-	mV/°C

Note: Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in the output voltage from the value at V_{IN} = V_{OUT}+1V with a fixed load.

ASPL7328, +2.8V Output Type

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
V _{OUT}	Output Voltage	4.8V	I _{OUT} =10mA	2.744	2.800	2.856	V
I _{OUT}	Output Current	4.8V	-	-	250	-	mA
ΔV _{OUT}	Load Regulation	4.8V	1mA ≤ I _{OUT} ≤ 60mA	-	45	90	mV
V _{DIF}	Voltage Drop(Note)	-	I _{OUT} =40mA, ΔV _{OUT} =2%	-	100	-	mV
I _{SS}	Current Consumption	4.8V	No load	-	2.0	3.0	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	-	3.8V ≤ V _{IN} ≤ 12V I _{OUT} =40mA	-	0.2	-	%/V
V _{IN}	Input Voltage	-	-	-	-	15	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	4.8V	I _{OUT} =10mA -40°C < Ta < 85°C	-	±0.5	-	mV/°C

Note: Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in the output voltage from the value at V_{IN} = V_{OUT}+1V with a fixed load.

**ASPL7530, +3.0 Output Type**

Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
V _{OUT}	Output Voltage	5V	I _{OUT} =40mA	2.94	3.00	3.06	V
I _{OUT}	Output Current	5V	-	-	250	-	mA
ΔV _{OUT}	Load Regulation	5V	1mA ≤ I _{OUT} ≤ 80mA	-	45	90	mV
V _{DIF}	Voltage Drop(Note)	-	I _{OUT} =40mA, ΔV _{OUT} =2%	-	100	-	mV
I _{SS}	Current Consumption	5V	No load	-	2.0	3.0	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	-	4V ≤ V _{IN} ≤ 12V I _{OUT} =40mA	-	0.2	-	%/V
V _{IN}	Input Voltage	-	-	-	-	15	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	5V	I _{OUT} =40mA -40°C < T _a < 85°C	-	±0.5	-	mV/°C

Note: Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in the output voltage from the value at V_{IN} = V_{OUT}+1V with a fixed load.

ASPL7333, +3.3 Output Type

Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
V _{OUT}	Output Voltage	5.3V	I _{OUT} =40mA	3.234	3.300	3.366	V
I _{OUT}	Output Current	5.3V	-	-	250	-	mA
ΔV _{OUT}	Load Regulation	5.3V	1mA ≤ I _{OUT} ≤ 80mA	-	45	90	mV
V _{DIF}	Voltage Drop(Note)	-	I _{OUT} =40mA, ΔV _{OUT} =2%	-	100	-	mV
I _{SS}	Current Consumption	5.3V	No load	-	2.0	3.0	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	-	4.3V ≤ V _{IN} ≤ 12V I _{OUT} =40mA	-	0.2	-	%/V
V _{IN}	Input Voltage	-	-	-	-	15	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	5.3V	I _{OUT} =40mA -40°C < T _a < 85°C	-	±0.5	-	mV/°C

Note: Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in the output voltage from the value at V_{IN} = V_{OUT}+1V with a fixed load.

ASPL7336, +3.6V Output Type

Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
V _{OUT}	Output Voltage	5.6V	I _{OUT} =40mA	3.528	3.600	3.672	V
I _{OUT}	Output Current	5.6V	-	-	250	-	mA
ΔV _{OUT}	Load Regulation	5.6V	1mA ≤ I _{OUT} ≤ 80mA	-	45	90	mV
V _{DIF}	Voltage Drop(Note)	-	I _{OUT} =40mA, ΔV _{OUT} =2%	-	80	-	mV
I _{SS}	Current Consumption	5.6V	No load	-	2.0	3.0	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	-	4.6V ≤ V _{IN} ≤ 12V I _{OUT} =40mA	-	0.2	-	%/V
V _{IN}	Input Voltage	-	-	-	-	15	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	5.6V	I _{OUT} =40mA -40°C < T _a < 85°C	-	±0.5	-	mV/°C

Note: Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in the output voltage from the value at V_{IN} = V_{OUT}+1V with a fixed load.

ASPL7340, +4.0V Output Type

Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
V _{OUT}	Output Voltage	6.0V	I _{OUT} =40mA	3.920	4.000	4.080	V
I _{OUT}	Output Current	6.0V	-	-	250	-	mA
ΔV _{OUT}	Load Regulation	6.0V	1mA ≤ I _{OUT} ≤ 80mA	-	45	90	mV
V _{DIF}	Voltage Drop(Note)	-	I _{OUT} =40mA, ΔV _{OUT} =2%	-	80	-	mV
I _{SS}	Current Consumption	6.0V	No load	-	2.0	3.0	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	-	5V ≤ V _{IN} ≤ 12V I _{OUT} =40mA	-	0.2	-	%/V
V _{IN}	Input Voltage	-	-	-	-	15	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	6.0V	I _{OUT} =40mA -40°C < T _a < 85°C	-	±0.5	-	mV/°C

Note: Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in the output voltage from the value at V_{IN} = V_{OUT}+1V with a fixed load.

**ASPL7344, +4.4V Output Type**

Ta=25°C

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
V _{OUT}	Output Voltage	6.4V	I _{OUT} =40mA	4.312	4.400	4.488	V
I _{OUT}	Output Current	6.4V	-	-	250	-	mA
ΔV _{OUT}	Load Regulation	6.4V	1mA ≤ I _{OUT} ≤ 80mA	-	45	90	mV
V _{DIF}	Voltage Drop(Note)	-	I _{OUT} =40mA, ΔV _{OUT} =2%	-	80	-	mV
I _{SS}	Current Consumption	6.4V	No load	-	2.0	3.0	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	-	5.4V ≤ V _{IN} ≤ 12V I _{OUT} =40mA	-	0.2	-	%/V
V _{IN}	Input Voltage	-	-	-	-	15	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	6.4V	I _{OUT} =40mA -40°C < Ta < 85°C	-	±0.5	-	mV/°C

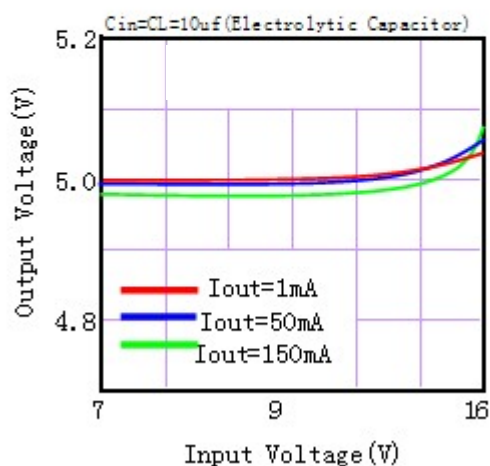
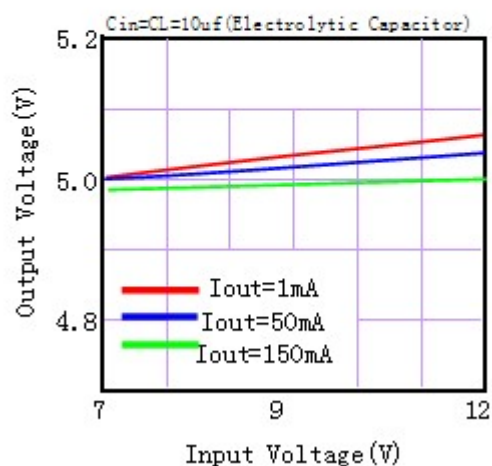
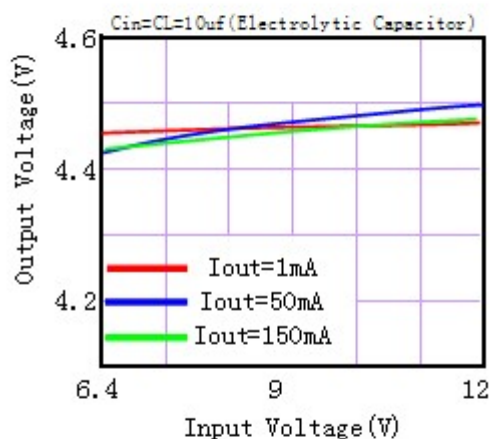
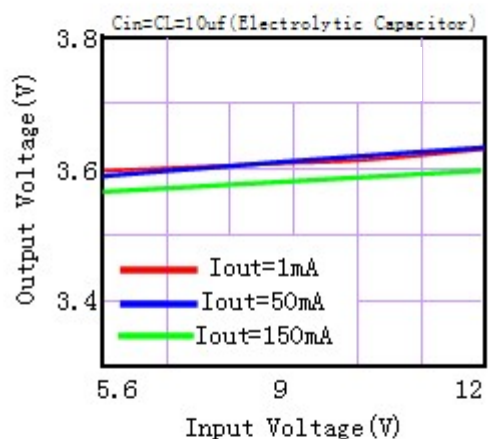
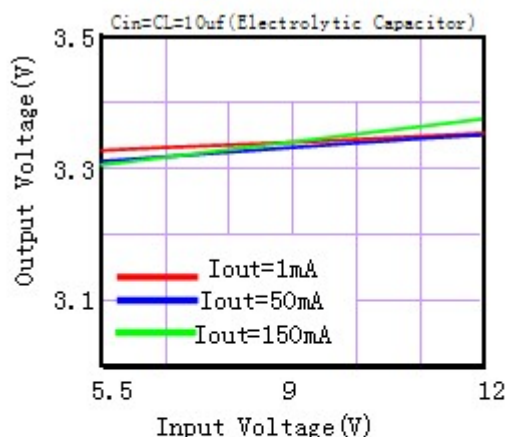
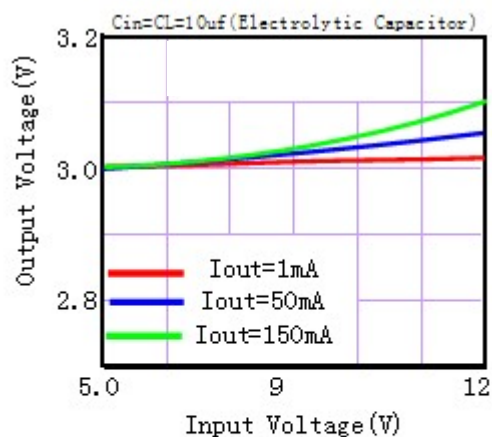
Note: Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in the output voltage from the value at V_{IN} = V_{OUT}+1V with a fixed load.

ASPL7350, +5.0V Output Type

Ta=25°C

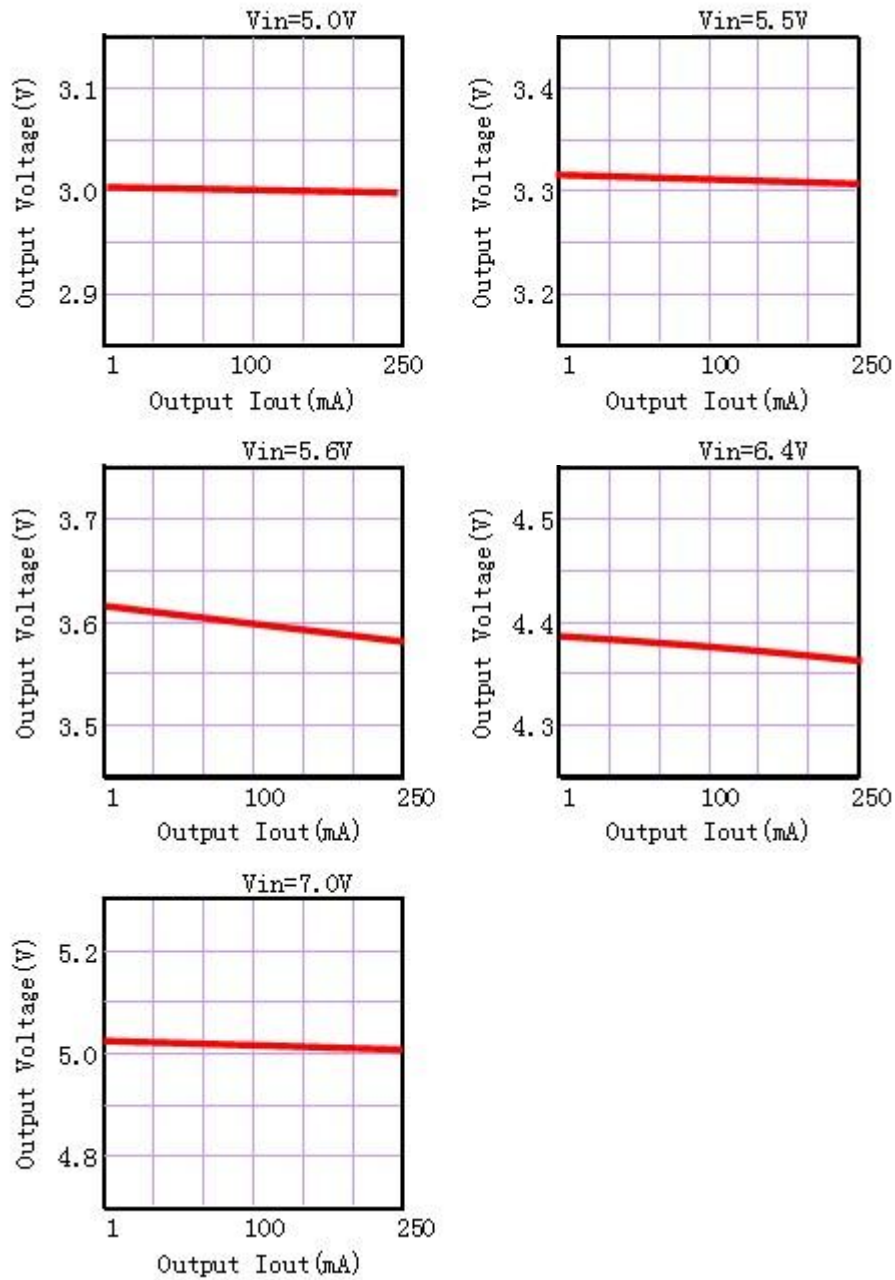
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V _{IN}	Conditions				
V _{OUT}	Output Voltage	7V	I _{OUT} =40mA	4.9	5.00	5.1	V
I _{OUT}	Output Current	7V	-	-	250	-	mA
ΔV _{OUT}	Load Regulation	7V	1mA ≤ I _{OUT} ≤ 80mA	-	45	90	mV
V _{DIF}	Voltage Drop(Note)	-	I _{OUT} =40mA, ΔV _{OUT} =2%	-	80	-	mV
I _{SS}	Current Consumption	7V	No load	-	2.0	3.0	μA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	-	6V ≤ V _{IN} ≤ 12V I _{OUT} =40mA	-	0.2	-	%/V
V _{IN}	Input Voltage	-	-	-	-	15	V
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	7V	I _{OUT} =40mA -40°C < Ta < 85°C	-	±0.5	-	mV/°C

Note: Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in the output voltage from the value at V_{IN} = V_{OUT}+1V with a fixed load.

**Typical Performance Characteristics****(1) Output Voltage vs Input voltage**

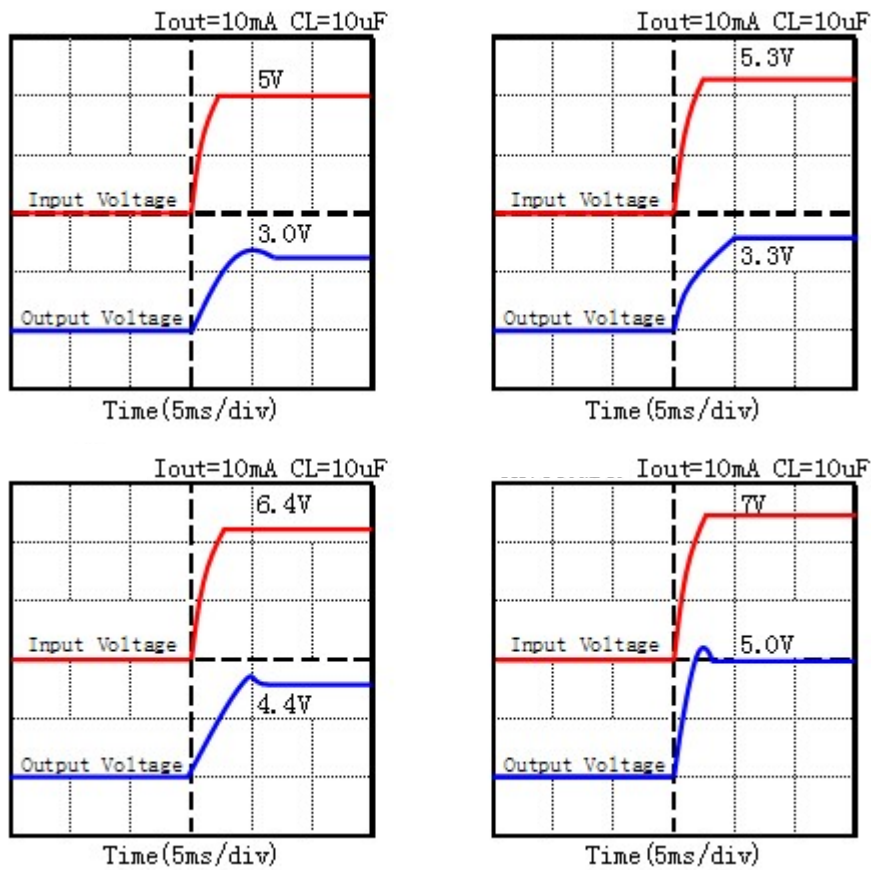


(2) Output Voltage vs. Output Current

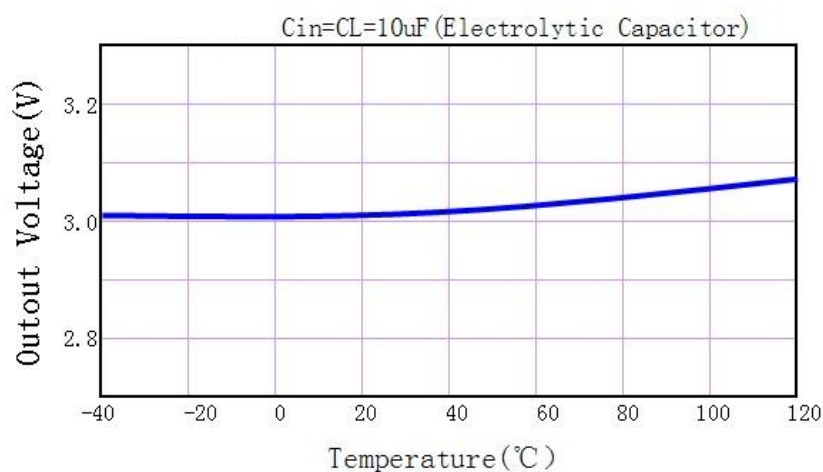




(3) Input Transient Response



(4) Output Voltage vs. Ambient Temperature



(5) MAX Output Current Vs. Input Voltage

ASPL7330

Input Voltage	Max Output Current
5V	250mA
9V	200mA
12V	150mA
15V	100mA

ASPL7333

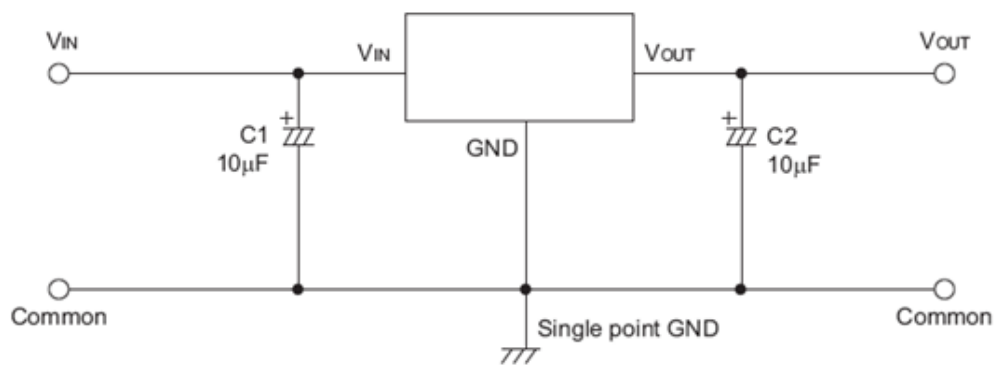
Input Voltage	Max Output Current
5.3V	250mA
9V	200mA
12V	150mA
15V	100mA

ASPL7350

Input Voltage	Max Output Current
7V	250mA
9V	200mA
12V	150mA
15V	100mA

Application Circuits

Basic Circuits

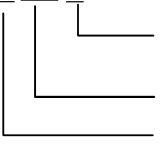


Ordering and Marking Information

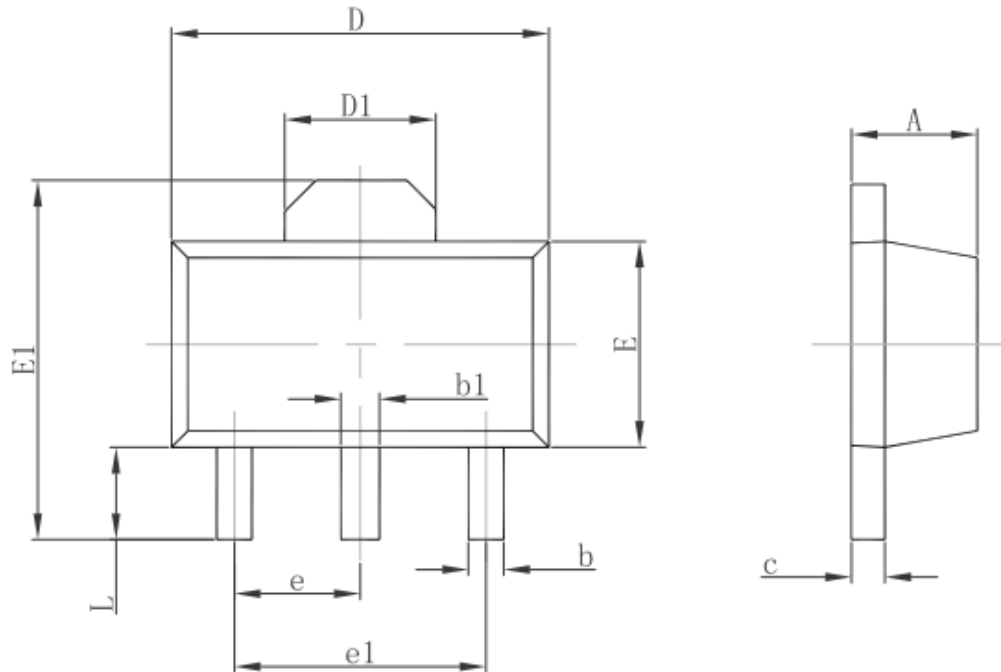
Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
ASPL73XXLP	73XX	TO-92	Bag		-	-
ASPL73XXZB	3XX	SOT23-3	REEL	3000	-	-
ASPL73XXDI	73XX	SOT89-3	REEL	3000	-	-
ASPL73XXZA	3XX	SOT23	REEL	3000	-	-

PACKAGE	MARKING
SOT23 SOT23-3 SOT89-3 TO-92	正面丝印

Ordering Number		Package
Lead Free	Halogen Free	
ASPL73XX-TP-B	ASPL73XXG-TP-B	TO-92
ASPL73XX-ZB-R	ASPL73XXG-ZB-R	SOT23-3
ASPL73XX-DI-R	ASPL73XXG-DI-R	SOT89-3
ASPL73XX-ZA-R	ASPL73XXG-DI-R	SOT23

ASPL73XXG-ZB-R  1 Packing Type 2 Package Type 3 Green Package	1 T:Tube,R:Tape Reel 2 ZB: SOT23-3 TP: TO-92 DI:SOT89-3 ZA:SOT23 3 blank : Lead Free G:Halogen Free and Lead Free
--	---

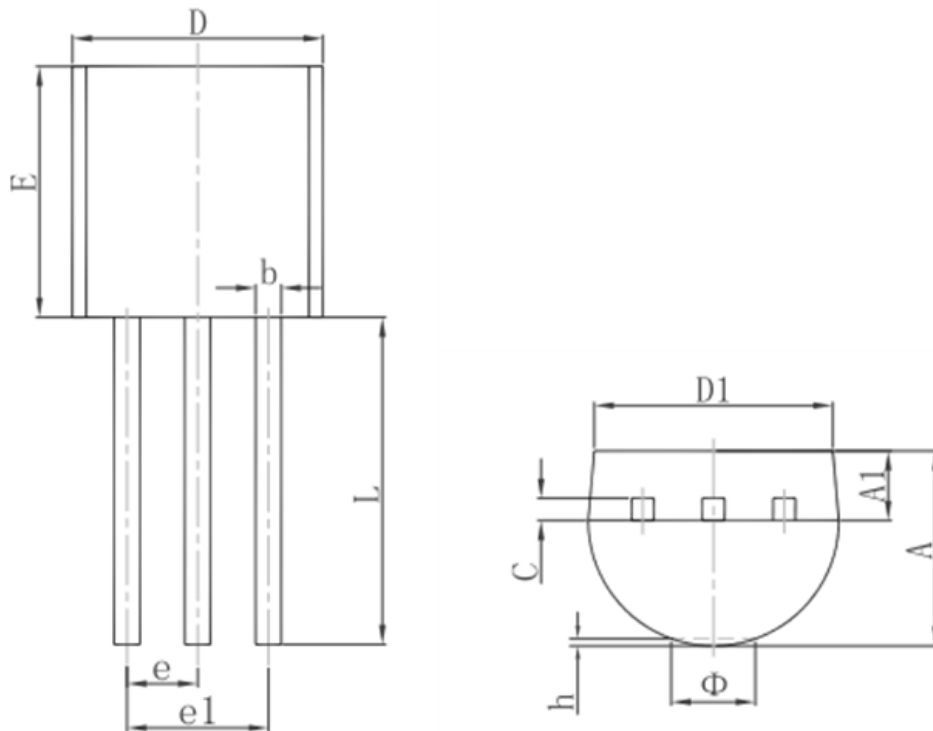
3-pin SOT89 Outline Dimensions



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

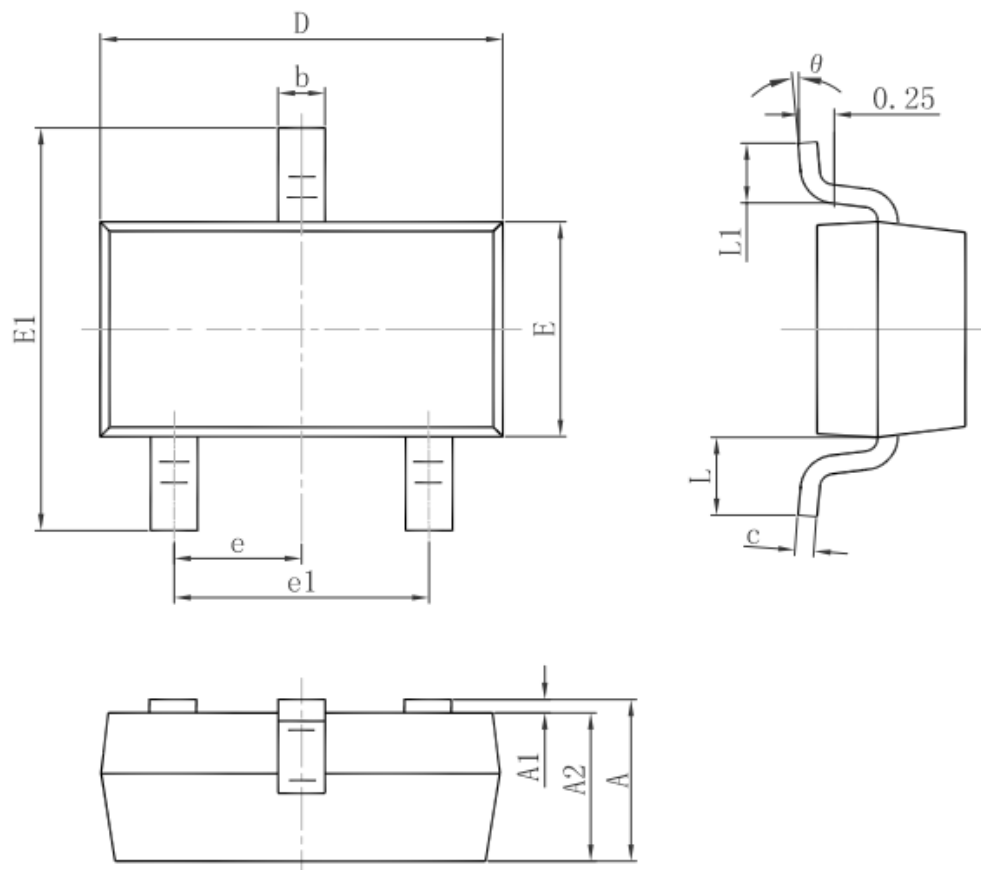
Package Information

3-pin TO92 Outline Dimensions

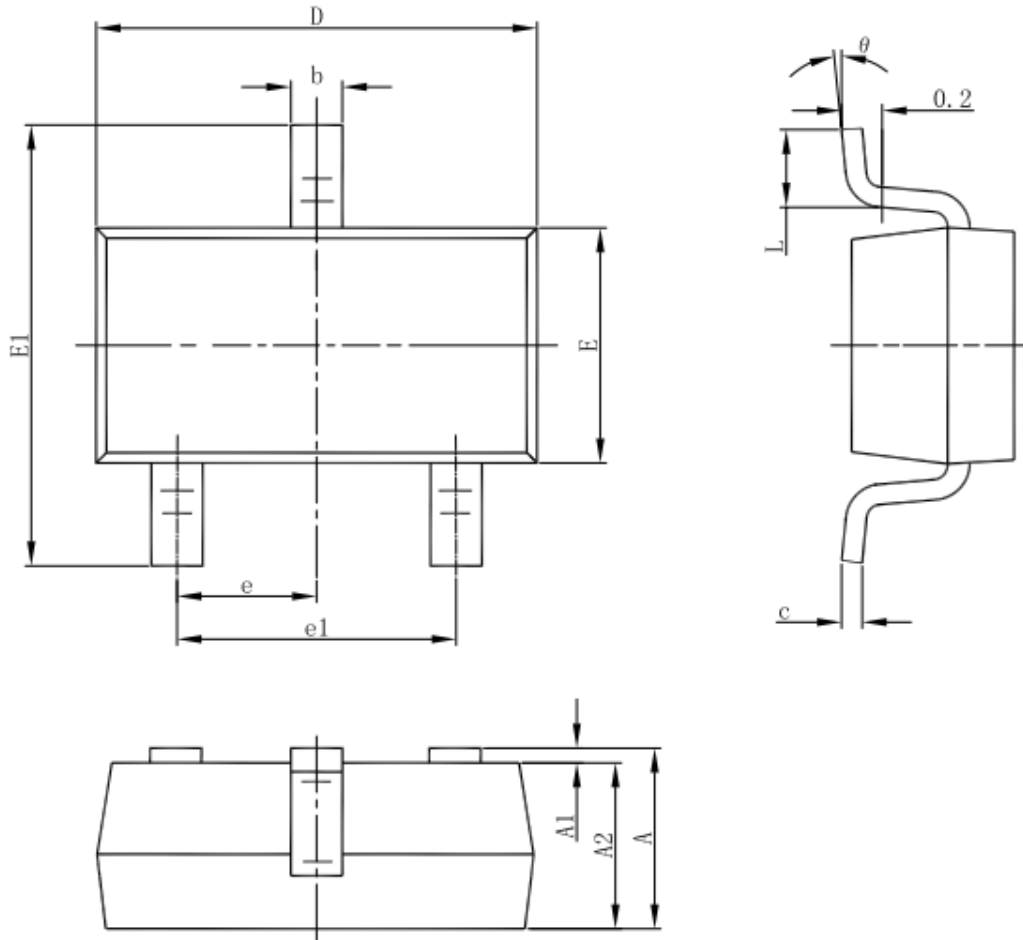


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.300	4.700	0.169	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270 TYP.		0.050 TYP.	
e1	2.440	2.640	0.096	0.104
L	14.100	14.500	0.555	0.571
Φ		1.600		0.063
h	0.000	0.380	0.000	0.015

3-pin SOT23 Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

**3-pin SOT23-3 Outline Dimensions**

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°

**IMPORTANT NOTICE**

Xi'an 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).

Xi'an 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. Xi'an 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 Xi'an 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 Xi'an Ascend Semiconductor Incorporated website, harmless against all damages.

Xi'an 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 Xi'an Ascend Semiconductor Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Xi'an 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