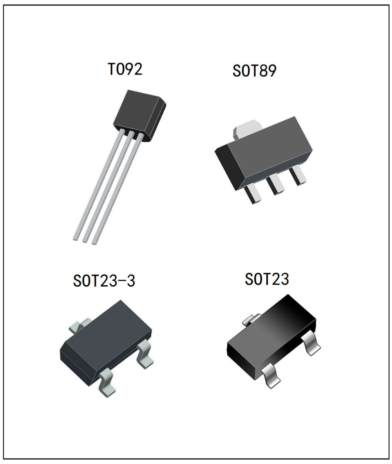
250mA Current、15V Input Voltage LDO

H73XX-A

General Description

The H73XX-A series is a set of three-terminal low power high voltage regulators implemented in CMOS technology. They allow input voltages as high as 18V. The series features extremely low quiescent current which is typically 2 µ A. They are available with several fixed output voltages ranging from 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.



Features

- Low power consumption
- Low voltage drop
- Low temperature coefficient
- Ultra low quiescent current: 2μA(typ.)
- High input voltage (up to 15V)
- Maximum output current: 250mA
- Output voltage accuracy: tolerance ±2%
- TO92, SOT89,SOT23 and SOT23-3 package

Applications

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

Order specification

Part No	Package	Manner of Packing	Devices per bag/reel
H73XX-ATX	TO92	Bag	1000PCS/bag
H73XX-APX	SOT89	Reel	1000PCS/reel
H73XX-ANX	SOT23	Reel	3000PCS/reel
H73XX-AMX	SOT23-3	Reel	3000PCS/reel

Description of selection

Part No	Output Voltage	Output Voltage Accuracy
H7315-AXX	1.5V	±2%
H7318-AXX	1.8V	±2%
H7325-AXX	2.5V	±2%
H7328-AXX	2.8V	±2%
H7330-AXX	3.0V	±2%
H7333-AXX	3.3V	±2%
H7336-AXX	3.6V	±2%
H7340-AXX	4.0V	±2%
H7344-AXX	4.4V	±2%
H7350-AXX	5.0V	±2%

Print rules

Package	Marking
TO92	73XX-A
SOT89	73XX-A
SOT23	3XX
SOT23-3	3XX

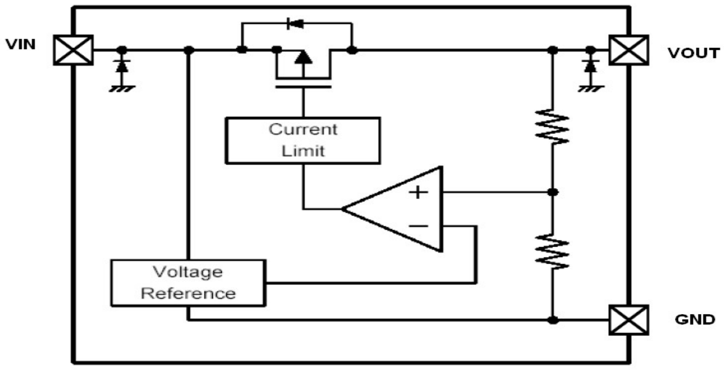
Note:”XX” stands for output voltages. Other voltages can be specially customized.

Type selection guide

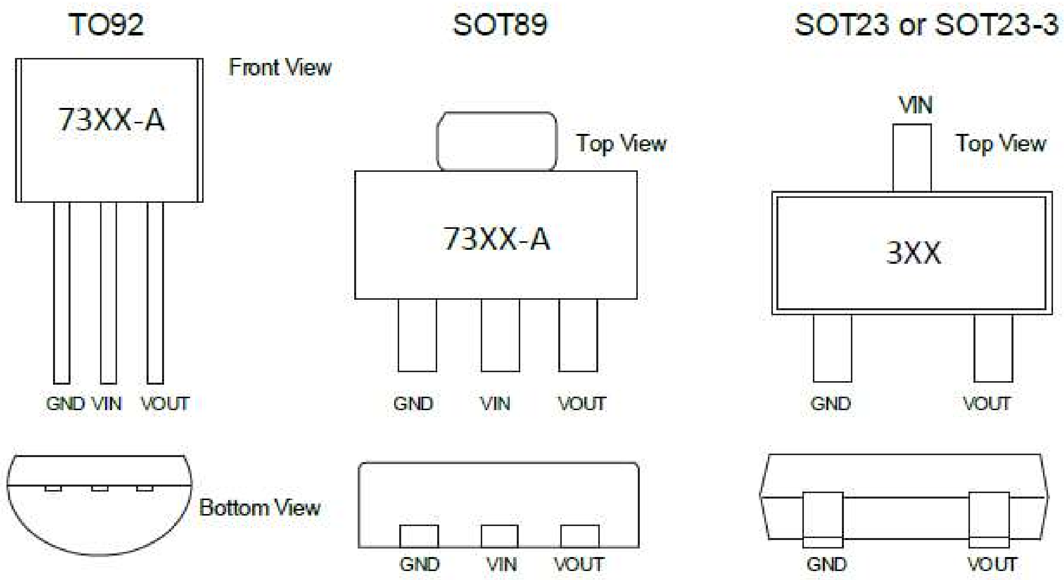
H73①②-A③④

Designator	Symbol	Description
①②	Integer	Output Voltage(1.5~5.0V)
③	T	Package:TO-92
	P	Package:SOT89
	N	Package:SOT23
	M	Package:SOT23-3
④	R	RoHS / Pb Free
	G	Halogen Free

Block Diagram and Pin Arrangement Diagram



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



Pin Assignment

Pin No.	Pin Name	Description
1	GND	Ground connection.
2	VIN	Supply Voltage Input.
3	VOUT	Output.

Functional Description

The H73XX-A series is a set of three-terminal low power high voltage regulators implemented in CMOS technology. They allow input voltages as high as 18V. They are available with several fixed output voltages ranging from 2.5V to 5.0V.

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Supply Voltage Input	VIN	-0.3~18	V
Operating Temperature	Tamb	-30~85	℃
Storage Temperature	Tstg	-50~125	℃

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

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

Note: P_D is measured at Ta= 25℃.

Electrical Characteristics

H7315-A，+1.5V Output Type

Parameter	Symbol	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
Output Voltage	V_{OUT}	3.5V	I_{OUT}=40mA	1.470	1.500	1.530	V
Output Current	I_{OUT}	3.5V	-	-	250	-	mA
Load Regulation	ΔV_{OUT}	3.5V	1mA≤I_{OUT}≤ 60mA	-	45	90	mV
Voltage Drop(Note)	V_{DIF}	-	I_{OUT}=40mA ΔV_{OUT}=2%	-	100	-	mV
Current Consumption	I_{SS}	3.5V	No load	-	2.0	3.0	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	2.5V≤V_{IN}≤12V I_{OUT}=40mA	-	0.2	-	%/V
Input Voltage	V_{IN}	-	-	-	-	15	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta Ta}$	3.5V	I_{OUT}=40mA -40℃<Ta<85℃	-	±0.5	-	mV/℃

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 VIN = VOUT+2V with a fixed load.

H7318-A，+1.8V Output Type

Parameter	Symbol	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
Output Voltage	V_{OUT}	3.8V	I_{OUT}=40mA	1.764	1.800	1.836	V
Output Current	I_{OUT}	3.8V	-	-	250	-	mA
Load Regulation	ΔV_{OUT}	3.8V	1mA≤I_{OUT}≤ 60mA	-	45	90	mV
Voltage Drop(Note)	V_{DIF}	-	I_{OUT}=40mA ΔV_{OUT}=2%	-	100	-	mV
Current Consumption	I_{SS}	3.8V	No load	-	2.0	3.0	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	2.8V≤V_{IN}≤12V I_{OUT}=40mA	-	0.2	-	%/V
Input Voltage	V_{IN}	-	-	-	-	15	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta Ta}$	3.8V	I_{OUT}=40mA -40℃<Ta<85℃	-	±0.5	-	mV/℃

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 VIN = VOUT+2V with a fixed load.

H7325-A，+2.5V Output Type

Parameter	Symbol	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
Output Voltage	V_{OUT}	4.5V	I_{OUT}=40mA	2.450	2.500	2.550	V
Output Current	I_{OUT}	4.5V	-	-	250	-	mA
Load Regulation	ΔV_{OUT}	4.5V	1mA$\leqslant I_{OUT}\leqslant$60mA	-	45	90	mV
Voltage Drop(Note)	V_{DIF}	-	I_{OUT}=40mA ΔV_{OUT}=2%	-	100	-	mV
Current Consumption	I_{SS}	4.5V	No load	-	2.0	3.0	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN}\times V_{OUT}}$	-	3.5V$\leqslant V_{IN}\leqslant$12V I_{OUT}=40mA	-	0.2	-	%/V
Input Voltage	V_{IN}	-	-	-	-	15	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta Ta}$	4.5V	I_{OUT}=40mA -40℃<Ta<85℃	-	±0.5	-	mV/℃

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 VIN = VOUT+2V with a fixed load.

H7328-A，+2.8V Output Type

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

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 VIN = VOUT+2V with a fixed load.

H7330-A，+3.0V Output Type

Parameter	Symbol	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
Output Voltage	V_{OUT}	5V	I_{OUT}=40mA	2.940	3.000	3.060	V
Output Current	I_{OUT}	5V	-	-	250	-	mA
Load Regulation	ΔV_{OUT}	5V	1mA≤I_{OUT}≤ 80mA	-	45	90	mV
Voltage Drop(Note)	V_{DIF}	-	I_{OUT}=40mA ΔV_{OUT}=2%	-	100	-	mV
Current Consumption	I_{SS}	5V	No load	-	2.0	3.0	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	4V≤V_{IN}≤12V I_{OUT}=40mA	-	0.2	-	%/V
Input Voltage	V_{IN}	-	-	-	-	15	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta Ta}$	5V	I_{OUT}=40mA -40℃<Ta<85℃	-	±0.5	-	mV/℃

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 VIN = VOUT+2V with a fixed load.

H7333-A，+3.3V Output Type

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

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 VIN = VOUT+2V with a fixed load.

H7336-A，+3.6V Output Type

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

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 VIN = VOUT+2V with a fixed load.

H7340-A，+4.0V Output Type

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

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 VIN = VOUT+2V with a fixed load.

H7344-A，+4.4V Output Type

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

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 VIN = VOUT+2V with a fixed load.

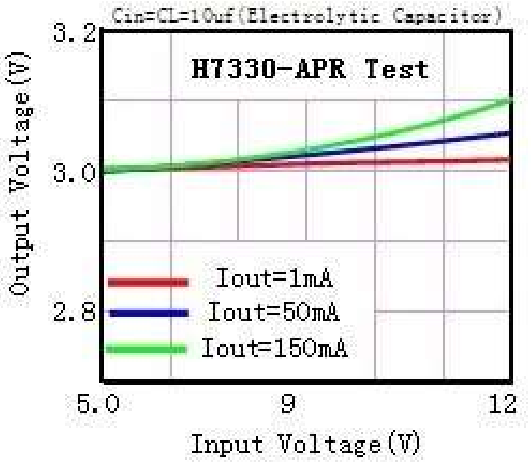
H7350-A，+5.0V Output Type

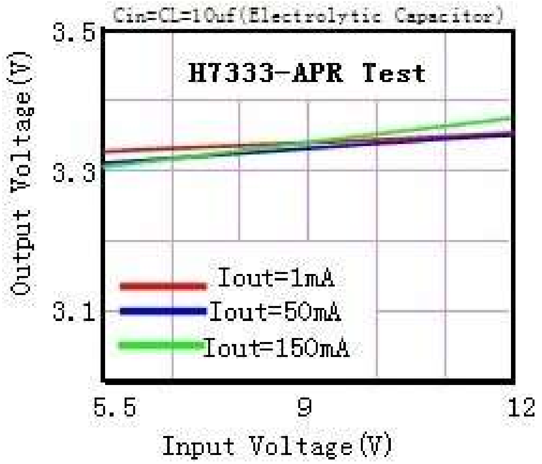
Parameter	Symbol	Test Conditions V_{IN}	Test Conditions Conditions	Min.	Typ.	Max.	Unit
Output Voltage	V_{OUT}	7V	I_{OUT}=40mA	4.900	5.000	5.100	V
Output Current	I_{OUT}	7V	-	-	250	-	mA
Load Regulation	ΔV_{OUT}	7V	1mA≤I_{OUT}≤ 80mA	-	45	90	mV
Voltage Drop(Note)	V_{DIF}	-	I_{OUT}=40mA ΔV_{OUT}=2%	-	80	-	mV
Current Consumption	I_{SS}	7V	No load	-	2.0	3.0	μA
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	5.4V≤V_{IN}≤12V I_{OUT}=40mA	-	0.2	-	%/V
Input Voltage	V_{IN}	-	-	-	-	15	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta Ta}$	7V	I_{OUT}=40mA -40℃<Ta<85℃	-	±0.5	-	mV/℃

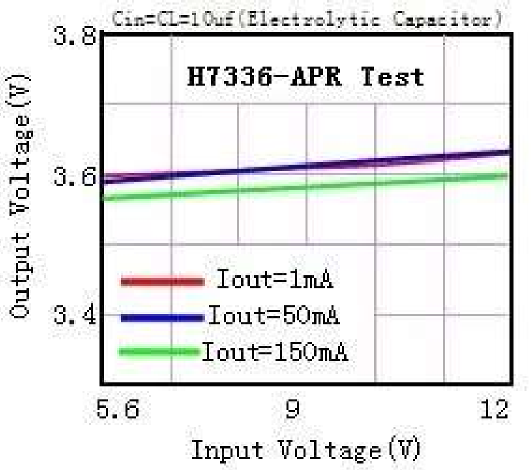
Note: Dropout voltage is defined as the input voltage minus the output voltage that produces a 2% change in the output voltage from the value at VIN = VOUT+2V with a fixed load.

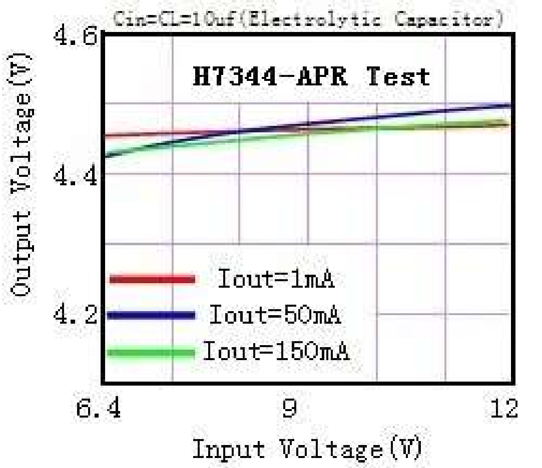
Typical Performance Characteristics

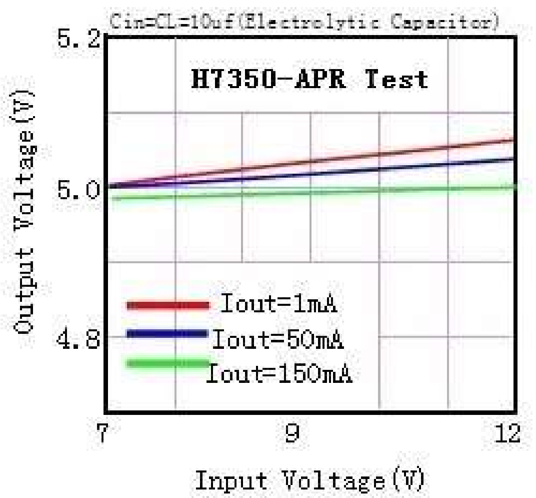
(1) Output Voltage vs Input voltage

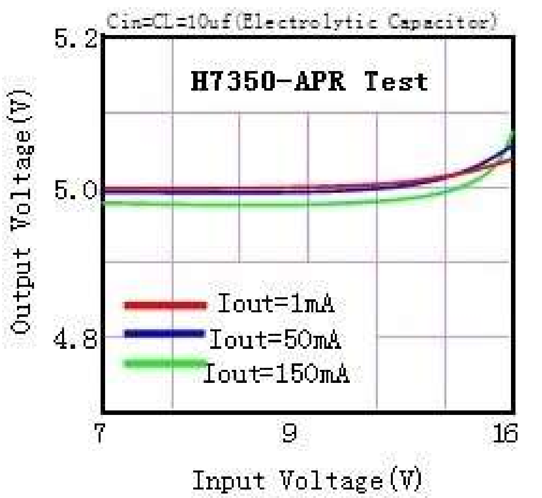




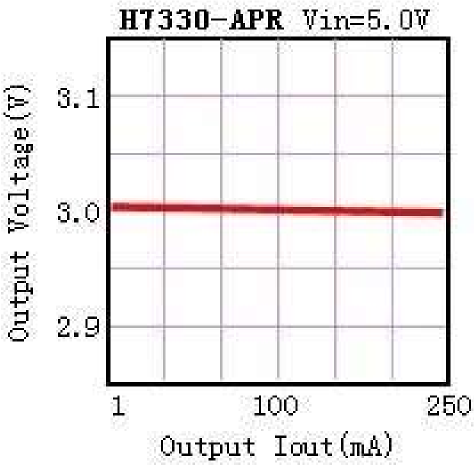


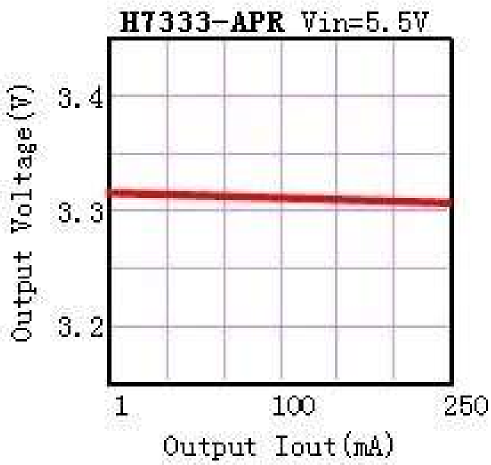


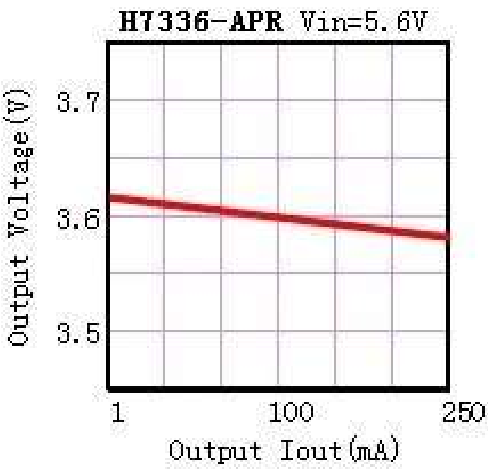


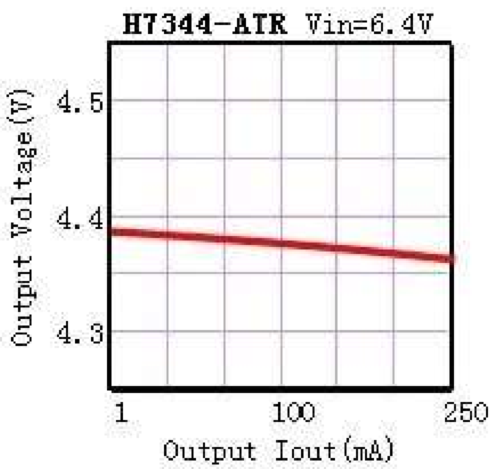


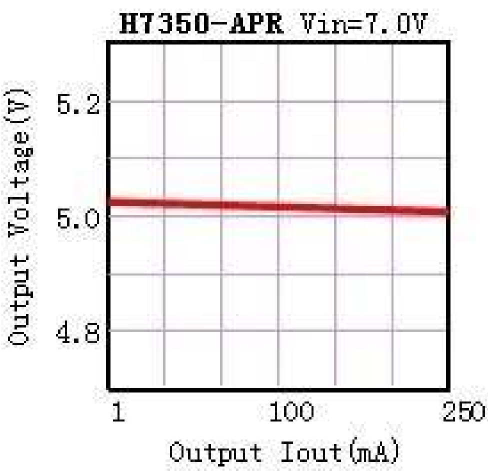
(2) Output Voltage vs.Output Current



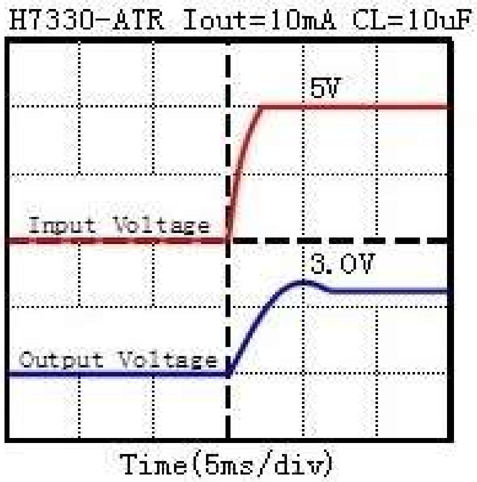


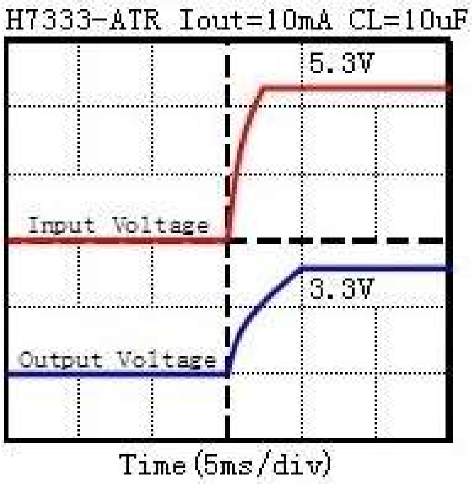


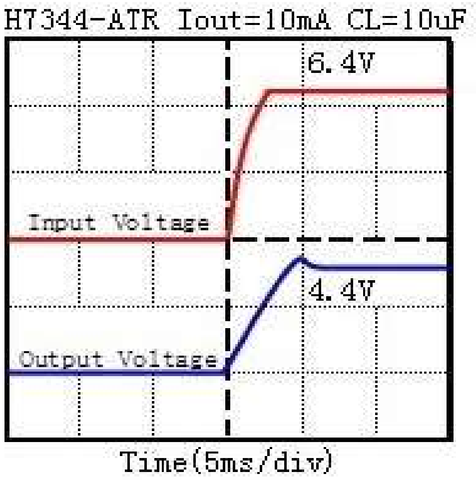


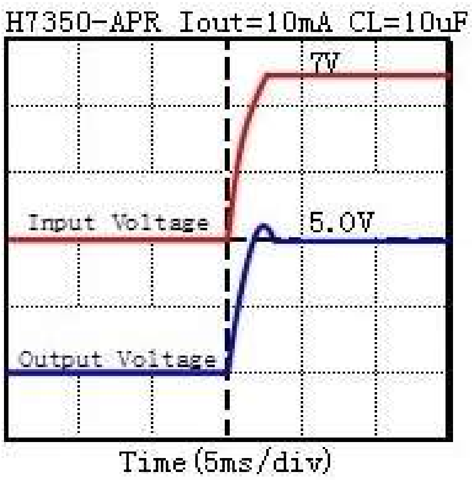


(3) Input Transient Response

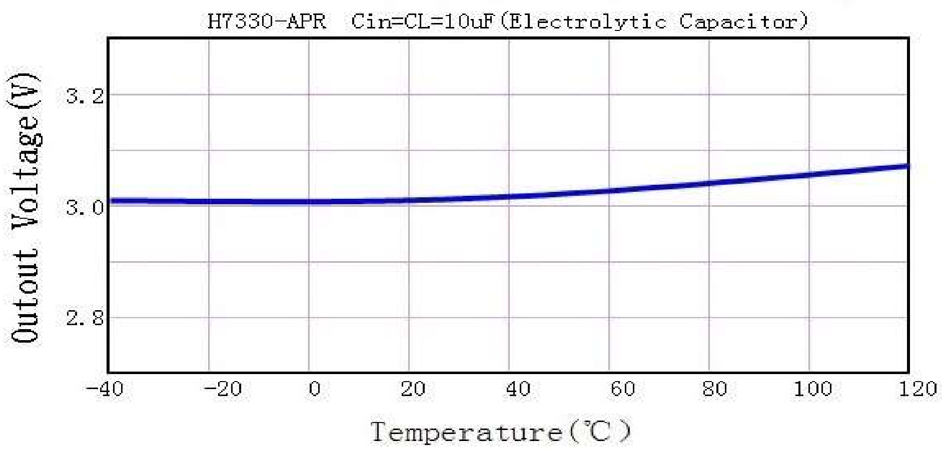








(4) Output Voltage vs.Ambient Temperature



(5) MAX Output Current Vs. Input Voltage

H7330-APR

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

H7333-APR

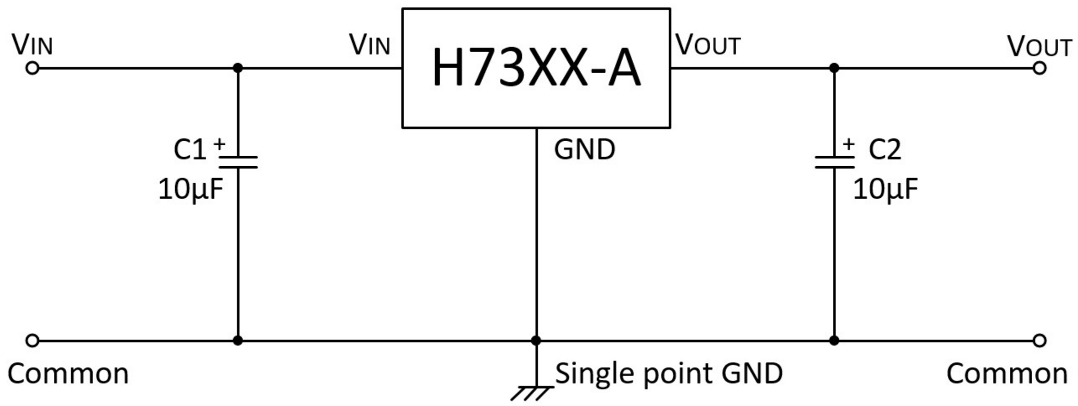
Input Voltage	Max Output Current
5.3V	250mA
9V	200mA
12V	150mA
15V	100mA

H7350-APR

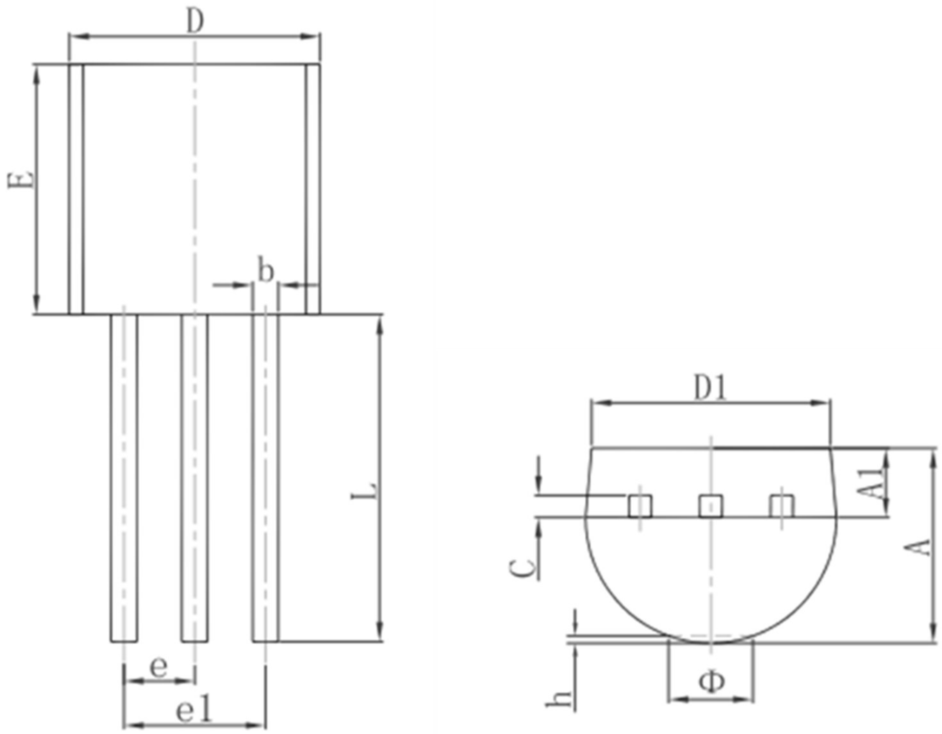
Input Voltage	Max Output Current
7V	250mA
9V	200mA
12V	150mA
15V	100mA

Application Circuits

Basic Circuits

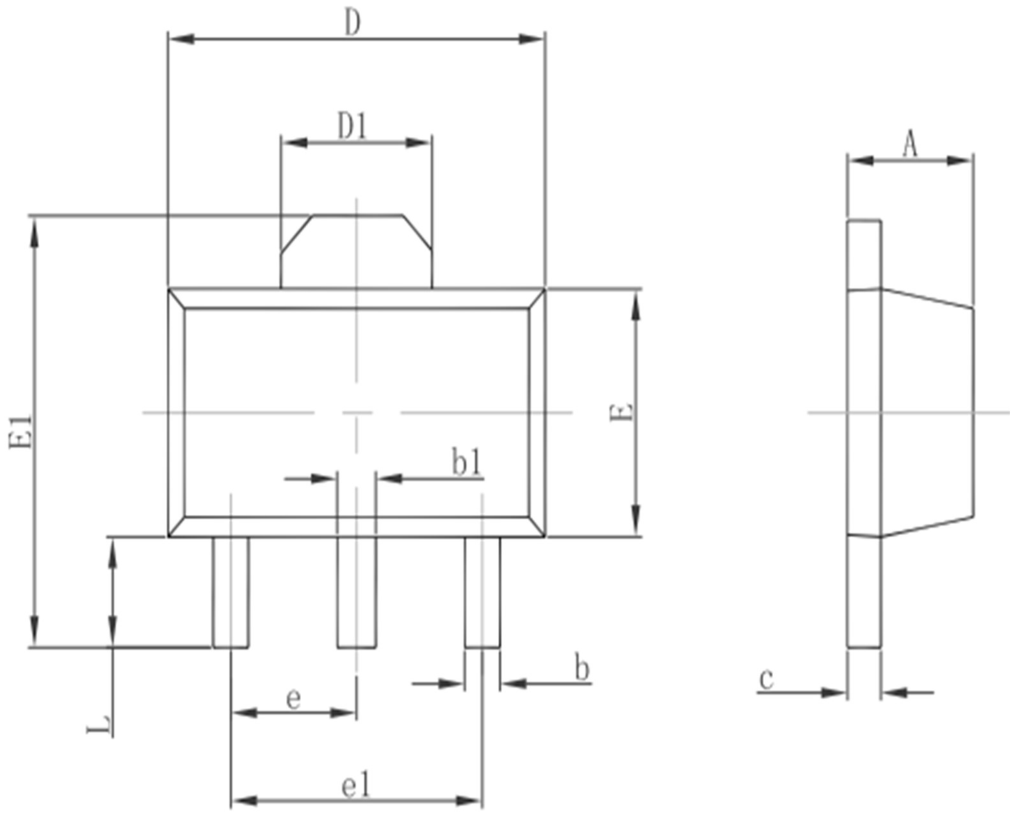


Package Information（TO92）



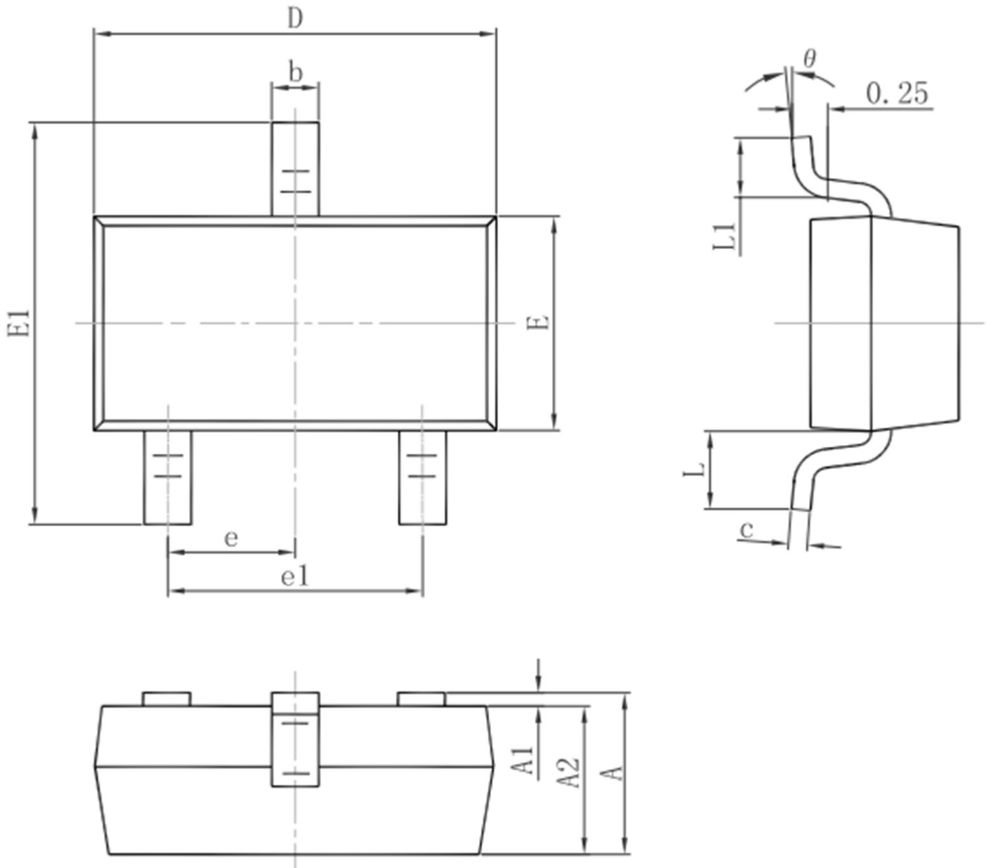
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.300	4.700	0.169	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270TYP.		0.050TYP.	
e1	2.440	2.640	0.096	0.104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

Package Information（SOT89）



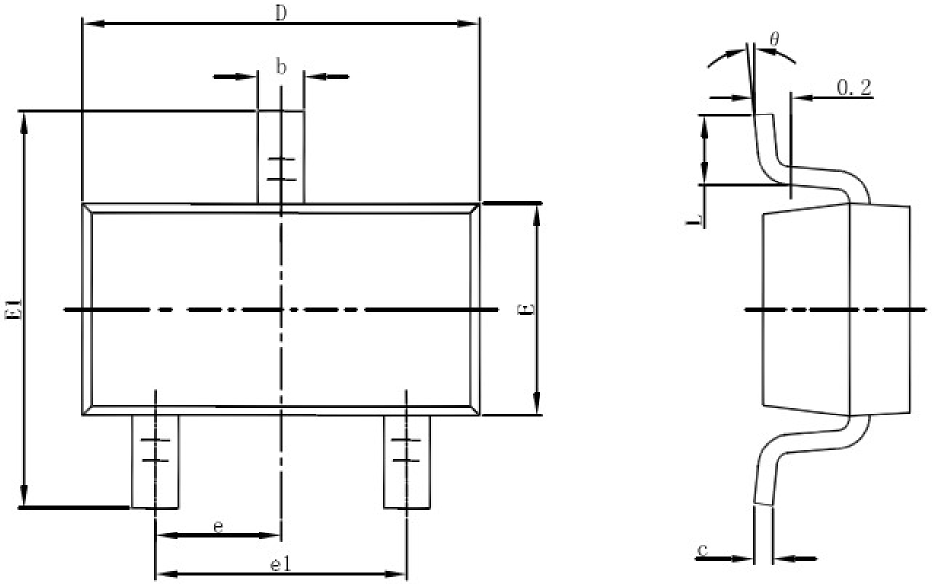
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550REF.		0.061REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500TYP.		0.060TYP.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

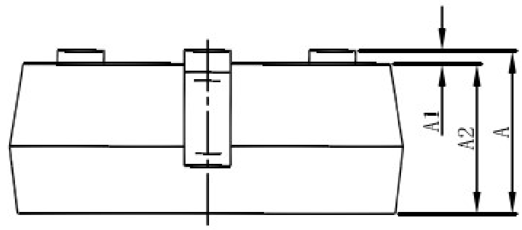
Package Information（SOT23）



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	0.950TYP.		0.037TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550REF.		0.022REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

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°

Special Instructions

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

Version Change Description

Version：V2.0 Author：Yangyang Time：2021.10.19

Modify the record：

1. Re-typesetting the manual and checking some data