# 150mA Current、15V Input Voltage LDO

H75XX-1

General Description

The H75XX-1 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 2.1V 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.
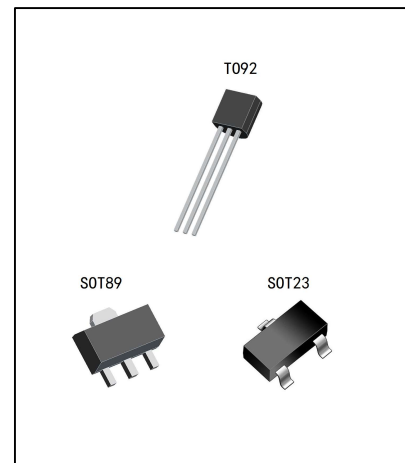
Features

- Low power consumption
- Low temperature coefficient
- Low voltage drop
- High input voltage (up to 15V)
- Output voltage accuracy: tolerance ±2%
- TO92, SOT89 and SOT23 package

Applications

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

Order specification

Part No	Package	Manner of Packing	Devices per bag/reel
H75XX-1TX	TO92	Bag	1000PCS/bag
H75XX-1PX	SOT89	Reel	1000PCS/reel
H75XX-1NX	SOT23	Reel	3000PCS/reel

Description of selection

Part No	Output Voltage	Output Voltage Accuracy
H7521-1XX	2.1V	±2%
H7525-1XX	2.5V	±2%
H7527-1XX	2.7V	±2%
H7530-1XX	3.0V	±2%
H7533-1XX	3.3V	±2%
H7536-1XX	3.6V	±2%
H7540-1XX	4.0V	±2%
H7544-1XX	4.4V	±2%
H7545-1XX	4.5V	±2%
H7550-1XX	5.0V	±2%

Print rules

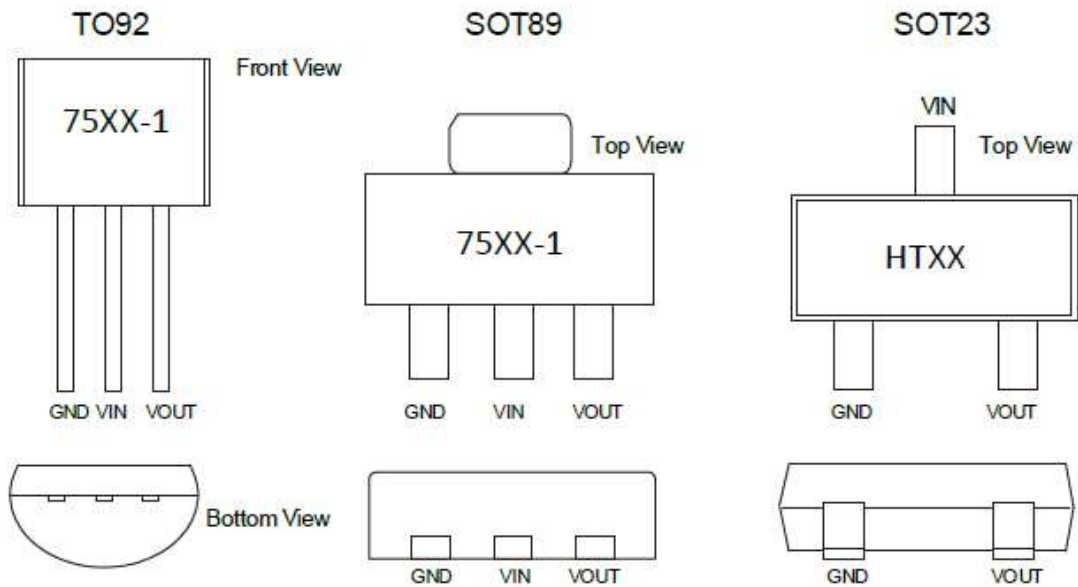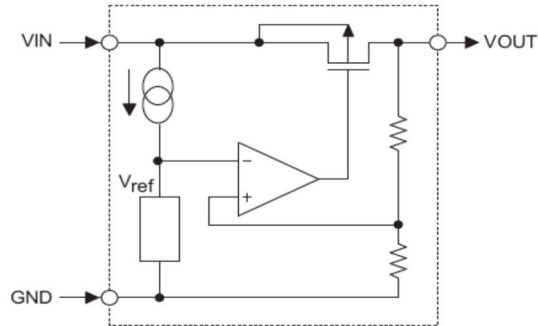| Package	Marking
TO92	75XXA-1
SOT89	75XX-1
SOT23	HTXX

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

Type selection guide

Note:H75①②-1③④

Designator	Symbol	Description
①②	Integer	Output Voltage(2.1~5.0V)
③	T	Package:TO-92
	P	Package:SOT89
	N	Package:SOT23
④	R	RoHS / Pb Free
	G	Halogen Free

Block Diagram and Pin Arrangement Diagram

Pin Assignment

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

Functional Description

The H75XX-1 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 2.1V to 5.0V.

Absolute Maximum Ratings

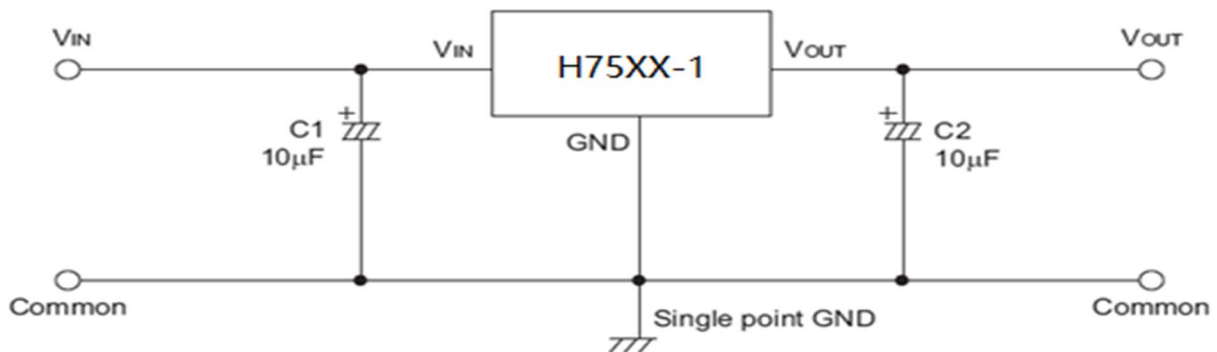| Parameter	Symbol	Value	Unit
Supply Voltage Input	VIN	-0.3~18	V
Operating Temperature	Tamb	-40~85	℃
Storage Temperature	Tstg	-50~125	℃

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℃

Basic Circuits

Electrical Characteristics

H7521-1，+2.1V Output Type

Parameter	Symbol	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
Output Voltage	V_{OUT}	4.1V	I_{OUT}=10mA	2.058	2.100	2.142	V
Output Current	I_{OUT}	4.1V	-	120	150	-	mA
Load Regulation	$\triangle V_{OUT}$	4.1V	1mA≤I_{OUT}≤50mA	-	60	150	mV
Voltage Drop(Note)	V_{DIF}	-	I_{OUT}=1mA $\triangle V_{OUT}$=2%	-	50	-	mV
Current Consumption	I_{SS}	4.1V	No load	-	1.5	3.0	μA
Line Regulation	$\dfrac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	3.1V≤V_{IN}≤16V I_{OUT}=1mA	-	0.2	-	%/V
Input Voltage	V_{IN}	-	-	-	-	15	V
Temperature Coefficient	$\dfrac{\Delta V_{OUT}}{\Delta Ta}$	4.1V	I_{OUT}=10mA 0℃<Ta<70℃	-	±0.37	-	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.

H7125-1，+2.5V Output Type

Parameter	Symbol	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
Output Voltage	V_{OUT}	4.5V	I_{OUT}=10mA	2.450	2.500	2.550	V
Output Current	I_{OUT}	4.5V	-	120	150	-	mA
Load Regulation	$\triangle V_{OUT}$	4.5V	1mA≤I_{OUT}≤50mA	-	60	150	mV
Voltage Drop(Note)	V_{DIF}	-	I_{OUT}=1mA $\triangle V_{OUT}$=2%	-	50	-	mV
Current Consumption	I_{SS}	4.5V	No load	-	1.5	2.0	μA
Line Regulation	$\dfrac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	3.5V≤V_{IN}≤16V I_{OUT}=1mA	-	0.2	-	%/V
Input Voltage	V_{IN}	-	-	-	-	15	V
Temperature Coefficient	$\dfrac{\Delta V_{OUT}}{\Delta Ta}$	4.5V	I_{OUT}=10mA 0℃<Ta<70℃	-	±0.41	-	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.

H7527-1，+2.7V Output Type

Parameter	Symbol	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
Output Voltage	V_{OUT}	4.7V	I_{OUT}=10mA	2.646	2.700	2.754	V
Output Current	I_{OUT}	4.7V	-	120	150	-	mA
Load Regulation	$\triangle V_{OUT}$	4.7V	1mA≤I_{OUT}≤20mA	-	60	150	mV
Voltage Drop(Note)	V_{DIF}	-	I_{OUT}=1mA $\triangle V_{OUT}$=2%	-	50	-	mV
Current Consumption	I_{SS}	4.7V	No load	-	1.5	2.0	μA
Line Regulation	$\dfrac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	3.5V≤V_{IN}≤16V I_{OUT}=1mA	-	0.2	-	%/V
Input Voltage	V_{IN}	-	-	-	-	15	V
Temperature Coefficient	$\dfrac{\Delta V_{OUT}}{\Delta Ta}$	4.7V	I_{OUT}=10mA 0℃<Ta<70℃	-	±0.43	-	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.

H7530-1，+3.0V Output Type

Parameter	Symbol	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
Output Voltage	V_{OUT}	5V	I_{OUT}=10mA	2.940	3.000	3.060	V
Output Current	I_{OUT}	5V	-	120	150	-	mA
Load Regulation	$\triangle V_{OUT}$	5V	1mA≤I_{OUT}≤50mA	-	60	150	mV
Voltage Drop(Note)	V_{DIF}	-	I_{OUT}=1mA $\triangle V_{OUT}$=2%	-	50	-	mV
Current Consumption	I_{SS}	5V	No load	-	1.5	2.0	μA
Line Regulation	$\dfrac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	4V≤V_{IN}≤16V I_{OUT}=1mA	-	0.2	-	%/V
Input Voltage	V_{IN}	-	-	-	-	15	V
Temperature Coefficient	$\dfrac{\Delta V_{OUT}}{\Delta Ta}$	5V	I_{OUT}=10mA 0℃<Ta<70℃	-	±0.45	-	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.

H7533-1，+3.3V Output Type

Parameter	Symbol	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
Output Voltage	V_{OUT}	5.3V	I_{OUT}=10mA	3.234	3.300	3.366	V
Output Current	I_{OUT}	5.3V	-	120	150	-	mA
Load Regulation	ΔV_{OUT}	5.3V	1mA≤I_{OUT}≤ 50mA	-	60	150	mV
Voltage Drop(Note)	V_{DIF}	-	I_{OUT}=1mA ΔV_{OUT}=2%	-	50	-	mV
Current Consumption	I_{SS}	5.3V	No load	-	1.5	2.0	μA
Line Regulation	$\dfrac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	4.5V≤V_{IN}≤16V I_{OUT}=1mA	-	0.2	-	%/V
Input Voltage	V_{IN}	-	-	-	-	15	V
Temperature Coefficient	$\dfrac{\Delta V_{OUT}}{\Delta Ta}$	5.3V	I_{OUT}=10mA 0℃<Ta<70℃	-	±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.

H7536-1，+3.6V Output Type

Parameter	Symbol	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
Output Voltage	V_{OUT}	5.6V	I_{OUT}=10mA	3.528	3.600	3.672	V
Output Current	I_{OUT}	5.6V	-	120	150	-	mA
Load Regulation	ΔV_{OUT}	5.6V	1mA≤I_{OUT}≤ 50mA	-	60	150	mV
Voltage Drop(Note)	V_{DIF}	-	I_{OUT}=1mA ΔV_{OUT}=2%	-	50	-	mV
Current Consumption	I_{SS}	5.6V	No load	-	1.5	2.0	μA
Line Regulation	$\dfrac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	4.6V≤V_{IN}≤16V I_{OUT}=1mA	-	0.2	-	%/V
Input Voltage	V_{IN}	-	-	-	-	15	V
Temperature Coefficient	$\dfrac{\Delta V_{OUT}}{\Delta Ta}$	5.6V	I_{OUT}=10mA 0℃<Ta<70℃	-	±0.6	-	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.

H7540-1，+4.0V Output Type

Parameter	Symbol	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
Output Voltage	V_{OUT}	6.0V	I_{OUT}=10mA	3.920	4.000	4.080	V
Output Current	I_{OUT}	6.0V	-	120	150	-	mA
Load Regulation	$\triangle V_{OUT}$	6.0V	1mA≤I_{OUT}≤50mA	-	60	150	mV
Voltage Drop(Note)	V_{DIF}	-	I_{OUT}=1mA $\triangle V_{OUT}$=2%	-	50	-	mV
Current Consumption	I_{SS}	6.0V	No load	-	1.5	2.0	μA
Line Regulation	$\dfrac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	5V≤V_{IN}≤16V I_{OUT}=1mA	-	0.2	-	%/V
Input Voltage	V_{IN}	-	-	-	-	15	V
Temperature Coefficient	$\dfrac{\Delta V_{OUT}}{\Delta Ta}$	6.0V	I_{OUT}=10mA 0℃<Ta<70℃	-	±0.6	-	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.

H7544-1，+4.4V Output Type

Parameter	Symbol	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
Output Voltage	V_{OUT}	6.4V	I_{OUT}=10mA	4.312	4.400	4.488	V
Output Current	I_{OUT}	6.4V	-	120	150	-	mA
Load Regulation	$\triangle V_{OUT}$	6.4V	1mA≤I_{OUT}≤50mA	-	60	150	mV
Voltage Drop(Note)	V_{DIF}	-	I_{OUT}=1mA $\triangle V_{OUT}$=2%	-	50	-	mV
Current Consumption	I_{SS}	6.4V	No load	-	1.5	2.0	μA
Line Regulation	$\dfrac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	5.4V≤V_{IN}≤16V I_{OUT}=1mA	-	0.2	-	%/V
Input Voltage	V_{IN}	-	-	-	-	15	V
Temperature Coefficient	$\dfrac{\Delta V_{OUT}}{\Delta Ta}$	6.4V	I_{OUT}=10mA 0℃<Ta<70℃	-	±0.7	-	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.

H7545-1，+4.5V Output Type

| Parameter	Symbol	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
Output Voltage	V_{OUT}	6.5V	I_{OUT}=10mA	4.410	4.500	4.590	V
Output Current	I_{OUT}	6.5V	-	120	150	-	mA
Load Regulation	$\triangle V_{OUT}$	6.5V	1mA≤I_{OUT}≤50mA	-	60	150	mV
Voltage Drop(Note)	V_{DIF}	-	I_{OUT}=1mA $\triangle V_{OUT}$=2%	-	50	-	mV
Current Consumption	I_{SS}	6.5V	No load	-	1.5	2.0	μA
Line Regulation	$\dfrac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	5.5V≤V_{IN}≤16V I_{OUT}=1mA	-	0.2	-	%/V
Input Voltage	V_{IN}	-	-	-	-	15	V
Temperature Coefficient	$\dfrac{\Delta V_{OUT}}{\Delta Ta}$	6.5V	I_{OUT}=10mA 0℃<Ta<70℃	-	±0.7	-	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.

H7550-1，+5.0V Output Type

Parameter	Symbol	Test Conditions		Min.	Typ.	Max.	Unit
		V_{IN}	Conditions				
Output Voltage	V_{OUT}	7V	I_{OUT}=10mA	4.9	5.00	5.1	V
Output Current	I_{OUT}	7V	-	120	150	-	mA
Load Regulation	$\triangle V_{OUT}$	7V	1mA≤I_{OUT}≤20mA	-	60	150	mV
Voltage Drop(Note)	V_{DIF}	-	I_{OUT}=1mA $\triangle V_{OUT}$=2%	-	50	-	mV
Current Consumption	I_{SS}	7V	No load	-	1.5	2.0	μA
Line Regulation	$\dfrac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	-	6V≤V_{IN}≤16V I_{OUT}=1mA	-	0.2	-	%/V
Input Voltage	V_{IN}	-	-	-	-	15	V
Temperature Coefficient	$\dfrac{\Delta V_{OUT}}{\Delta Ta}$	7V	I_{OUT}=10mA 0℃<Ta<70℃	-	±0.75	-	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.

Application Circuits

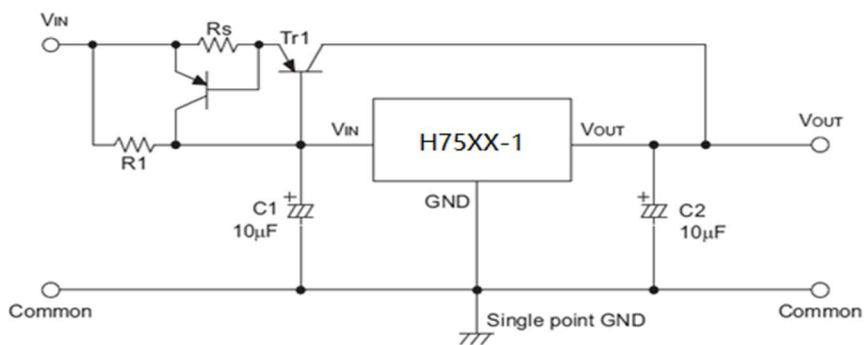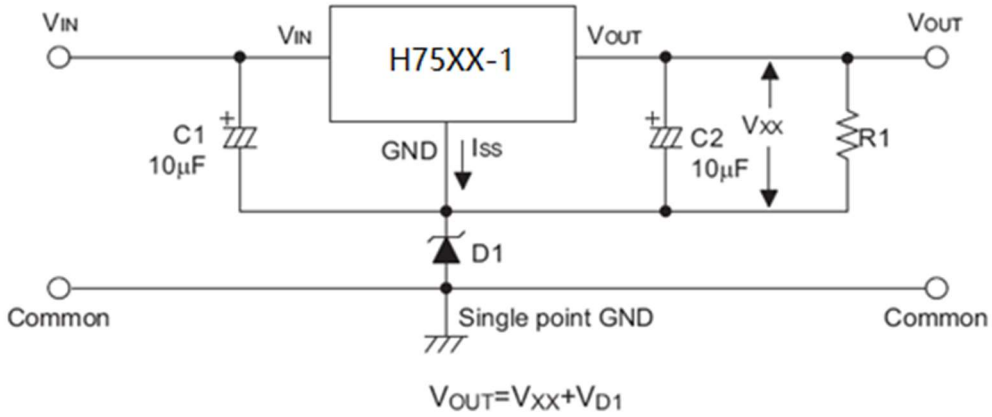### High Output Current Positive Voltage Regulator
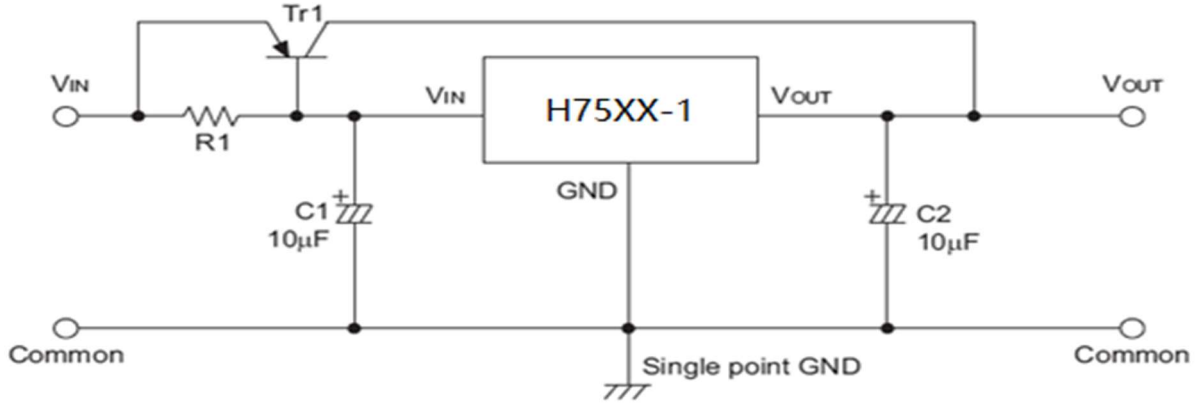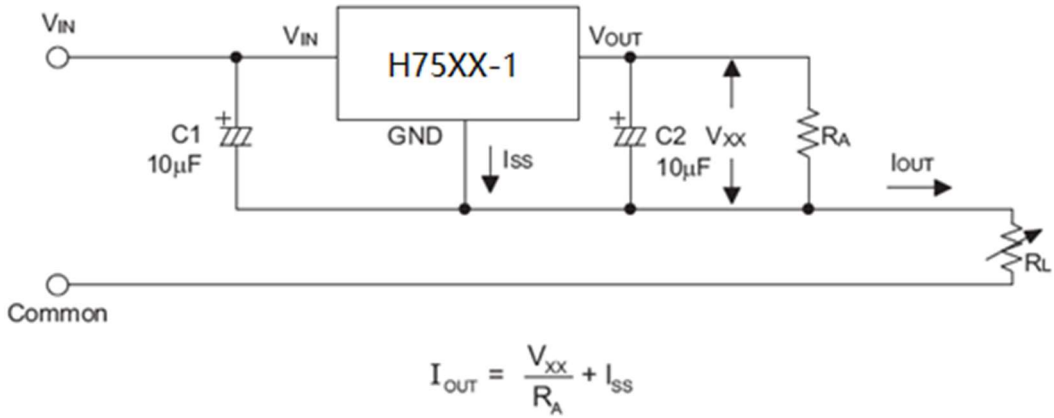

Short-Circuit Protection by Tr1
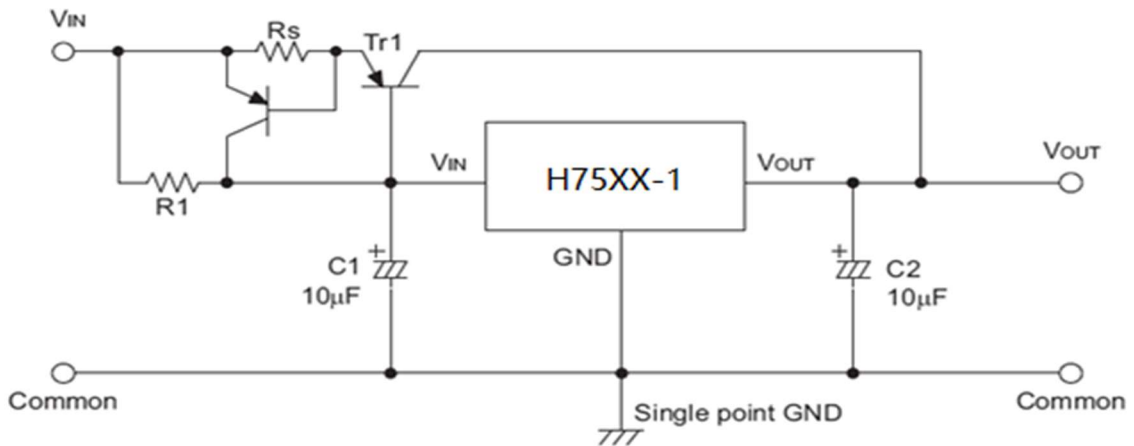
Circuit for Increasing Output Voltage

Circuit for Increasing Output Voltage

$$V_{OUT}=V_{XX}+V_{D1}$$

Constant Current Regulator

$$I_{OUT} = \frac{V_{XX}}{R_A} + I_{SS}$$

Dual Supply
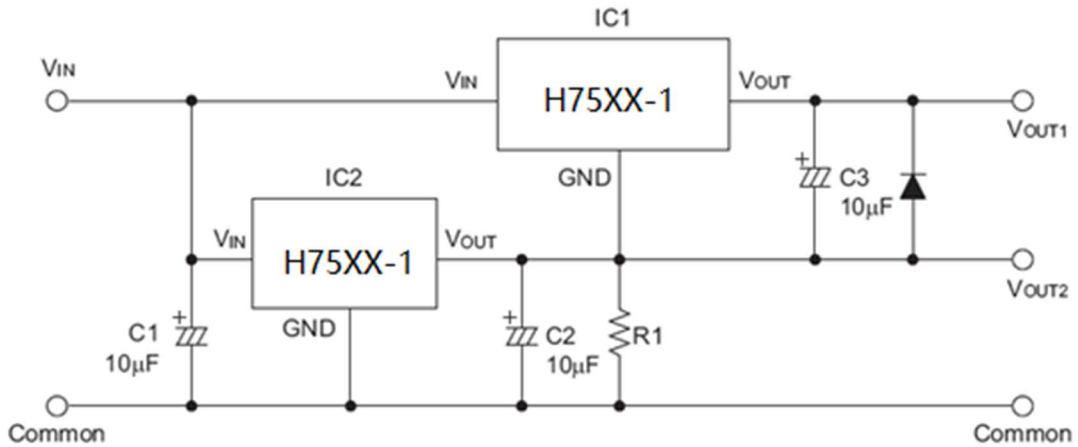
Package Information（TO92）
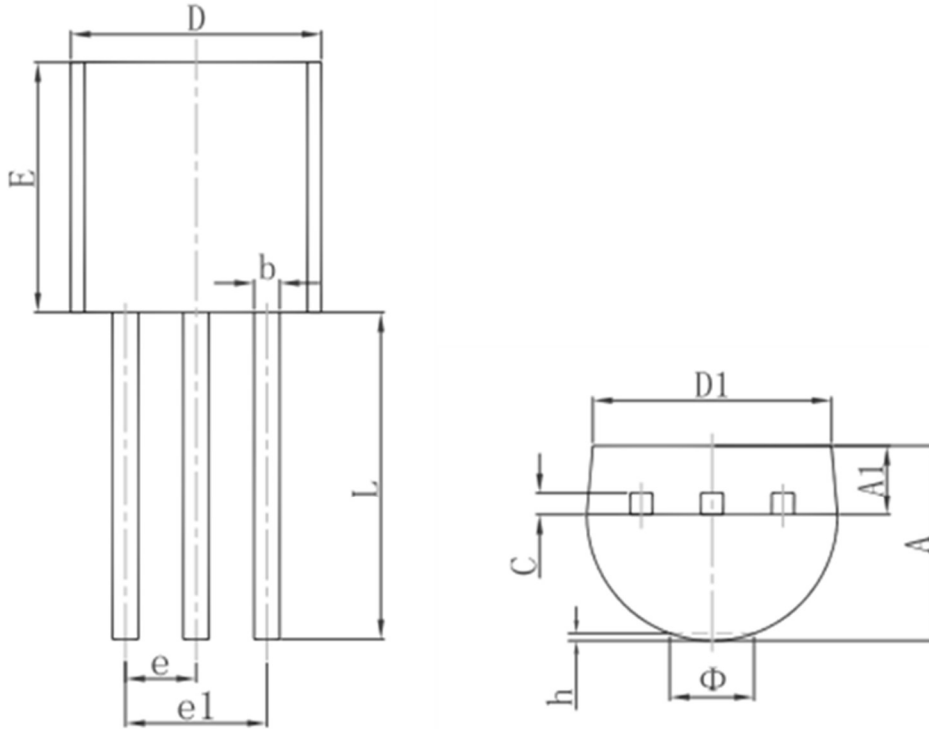
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.300	4.700	0.169	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270TYP.		0.050TYP.	
e1	2.440	2.640	0.096	0.104
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）
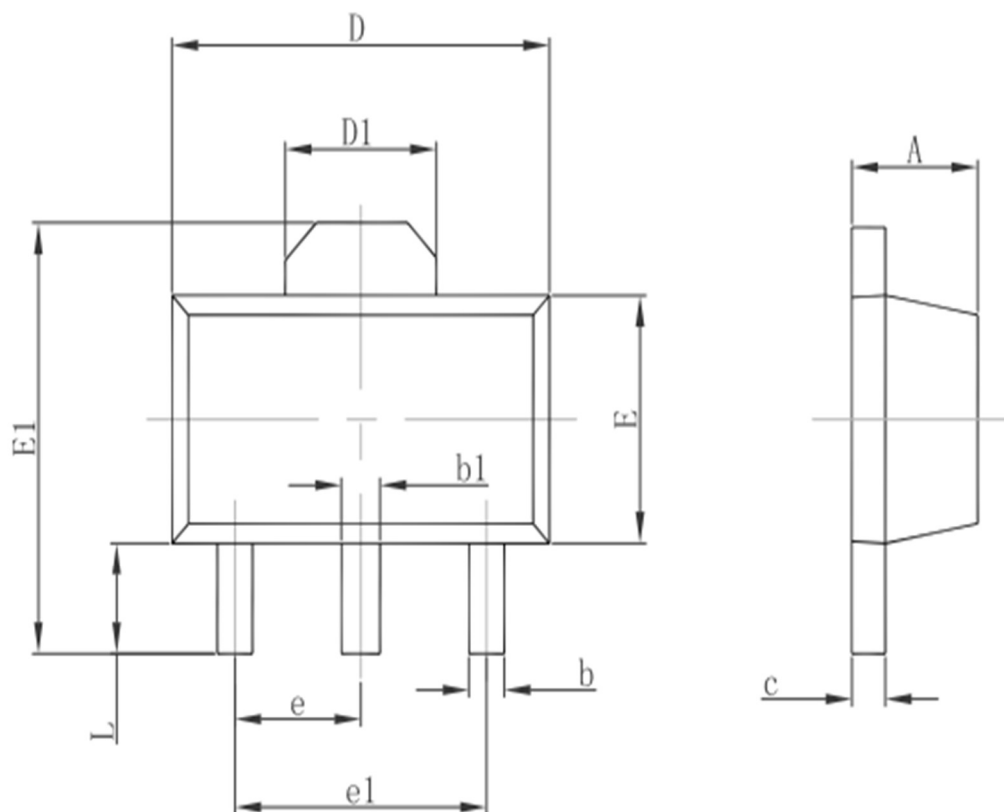
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550REF.		0.061REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500TYP.		0.060TYP.	
e1	3.000TYP.		0.118TYP.	
L	0.900	1.200	0.035	0.047

Package Information（SOT23）
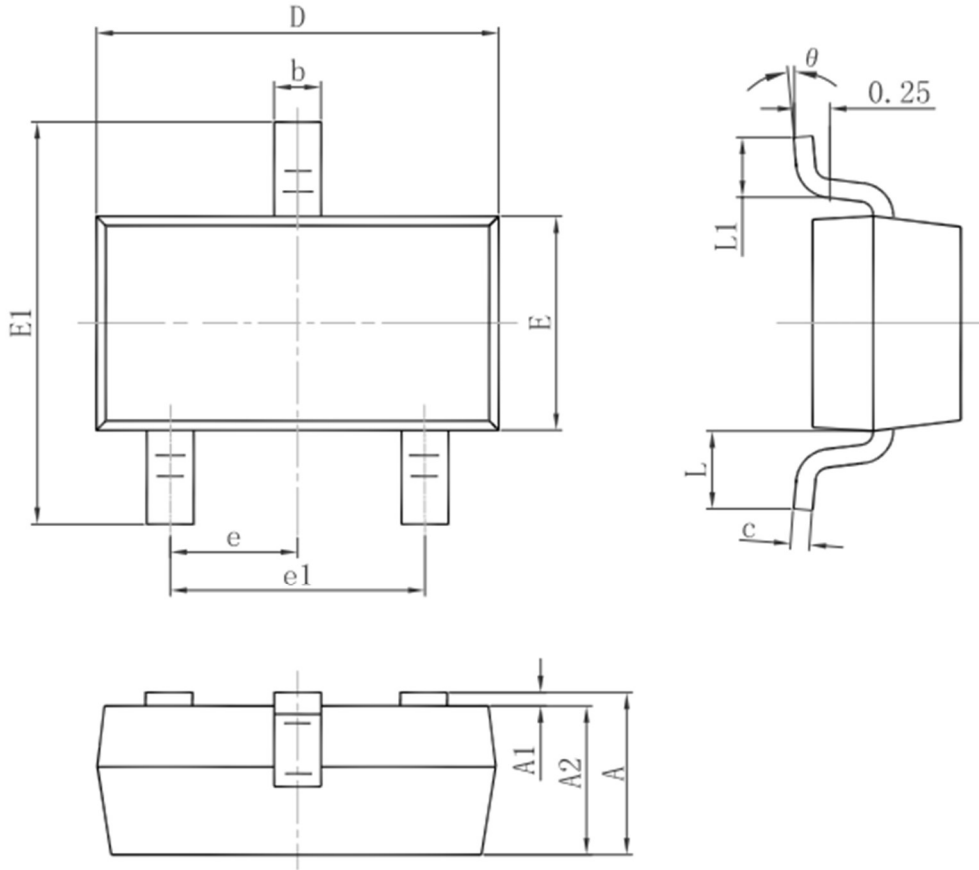
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950TYP.		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°

Special Instructions

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

Version Change Description

Version：V2.0 2021.10.21	Author：Yangyang	Time：

Modify the record：

1. Re-typesetting the manual and checking some data