

H75XX-H#

100mA Low Power LDO

Features

- Quiescent Current: 4.2uA@12V
- PSRR:60dB@100Hz
- Voltage drop:600mV@100mA
- ESD HBM:8KV
- High input voltage (up to 40V)
- Output voltage accuracy: tolerance $\pm 2\%$
- Output current:100mA(Typ.)
- TO92,SOT89 and SOT23-3 package

Applications

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

General Description

The H75XX-H# series is a set of three-terminal low power high voltage regulators implemented in CMOS technology. They allow input voltages as high as 40V. They are available with several fixed output voltages ranging from 1.8V 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	Marking
H7525-H#	2.5V	TO92 SOT89 SOT23-3	75XX-H#(for TO92) 75XX-H#(for SOT89) XXH(for SOT23-3)
H7527-H#	2.7V		
H7528-H#	2.8V		
H7530-H#	3.0V		
H7533-H#	3.3V		
H7536-H#	3.6V		
H7540-H#	4.0V		
H7544-H#	4.4V		
H7550-H#	5.0V		

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

TO92 & SOT89 packages will add a "#" mark at the end of the marking.

Order Information

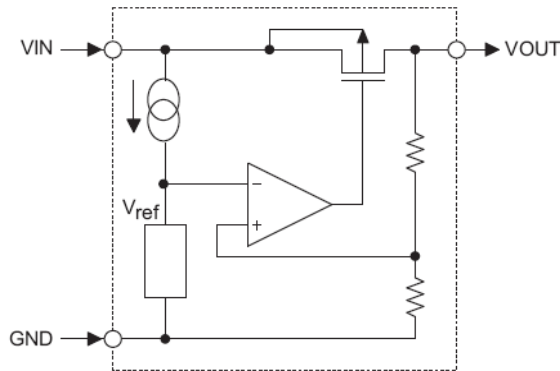
H75①②③④⑤

Designator	Symbol	Description
① ②	Integer	Output Voltage(1.8~5.0V)
③	-H#	Standard
④	T	Package:TO-92
	P	Package:SOT89
	M	Package:SOT23-3
⑤	R	RoHS / Pb Free
	G	Halogen Free

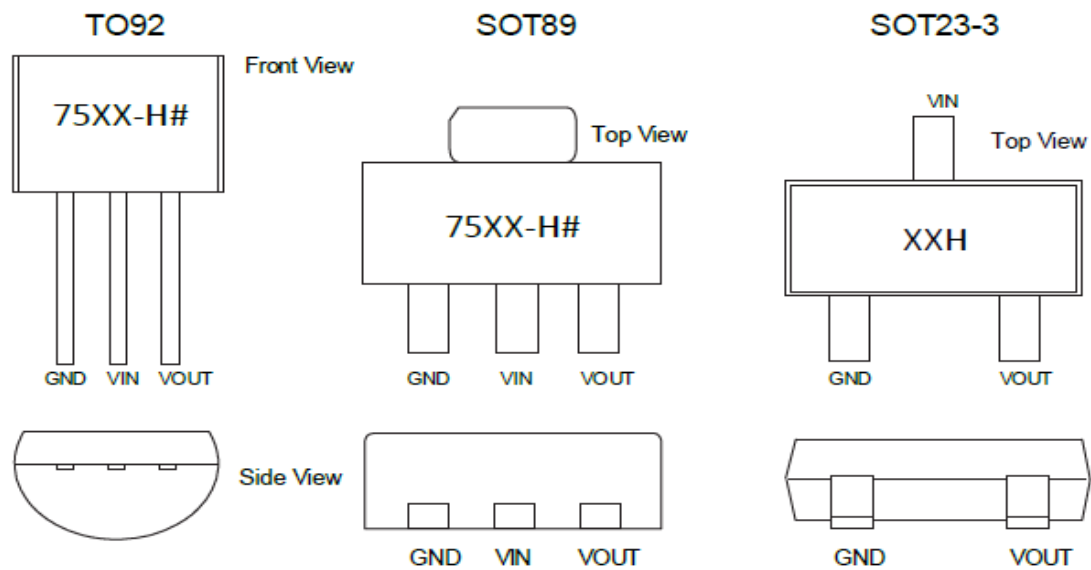
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Block Diagram



Pin Assignment



Absolute Maximum Ratings

Supply Voltage-0.3V to 45V Storage Temperature-50°C to 125°C

Operating Temperature-40°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)	TO92	200	°C/W
		SOT89	200	°C/W
		SOT23	500	°C/W
P_D	Power Dissipation	TO92	0.50	W
		SOT89	0.50	W
		SOT23	0.20	W

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

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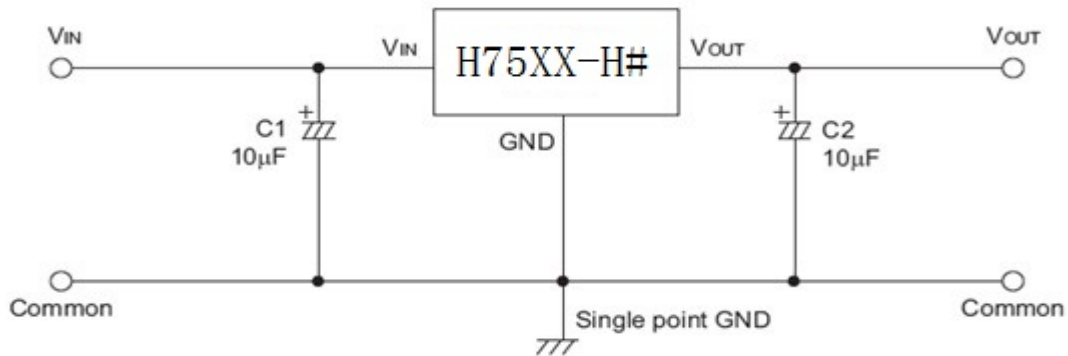
Electrical Characteristics

The following specifications apply for $V_{IN} = 12V$, $T_A = 25^\circ C$, $C_{IN} = C_{OUT} = 10\mu F$, unless specified otherwise.

SYMBOL	ITEMS	CONDITIONS	MIN	TYP	MAX	UNIT
V_{IN}	Input Range	$I_{OUT} = 10mA$	4.75		40	V
V_{OUT}	Output Range	$I_{OUT} = 10mA$	$V_{OUT} \times 0.98$	V_{OUT}	$V_{OUT} \times 1.02$	V
ΔV_{OUT}	Output Voltage	$V_{IN} = 12V, I_{OUT} = 10mA$	4.9	5	5.1	V
			3.234	3.3	3.366	
			2.94	3.0	3.06	
I_Q	Quiescent Current	$V_{IN} = 7V, I_{OUT} = 0$		4	6	μA
		$V_{IN} = 24V, I_{OUT} = 0$		4.6	6.7	
		$V_{IN} = 40V, I_{OUT} = 0$		5.4	8.2	
I_{OUT_PK}	Maximum Output Current	$V_{IN} = 12V, R_L = 1\Omega$		190		m
V_{DROP}	Dropout Voltage	$I_{OUT} = 10mA$		60	90	mV
		$I_{OUT} = 100mA$		600	900	
ΔV_{LINE}	Line Regulation	$V_{IN} = 7 \sim 24V, V_{OUT} = 5V, I_{OUT} = 1mA$		0.02	0.03	% / V
		$V_{IN} = 7 \sim 45V, V_{OUT} = 5V, I_{OUT} = 1mA$		0.08	0.1	
ΔV_{LOAD}	Load Regulation	$V_{IN} = 7V, I_{OUT} = 1 \sim 100mA$		19	37	m
I_{SHORT}	Short Current	V_{OUT} Short to GND with 1Ω (1ms pulse), $V_{IN} = 40V$		180		mA
PSRR	Power Supply Rejection Rate	$V_{IN} = 10V,$ $V_{PP} = 0.5V,$ $I_{OUT} = 1mA$	$F = 100Hz$	60		dB
			$F = 1kHz$	50		
			$F = 10kHz$	40		
e_{NO}	Output Noise Voltage	10Hz to 100kHz, $C_{OUT} = 10\mu F,$ $I_{OUT} = 10mA$		± 100		μV_{RMS}
T_{SD}	Thermal Shutdown Protection	$V_{IN} = 12V, I_{OUT} = 1mA$		165		$^\circ C$
$\Delta V_O / \Delta T$	Temperature Coefficient			± 0.5		mV / $^\circ C$

Application Circuits

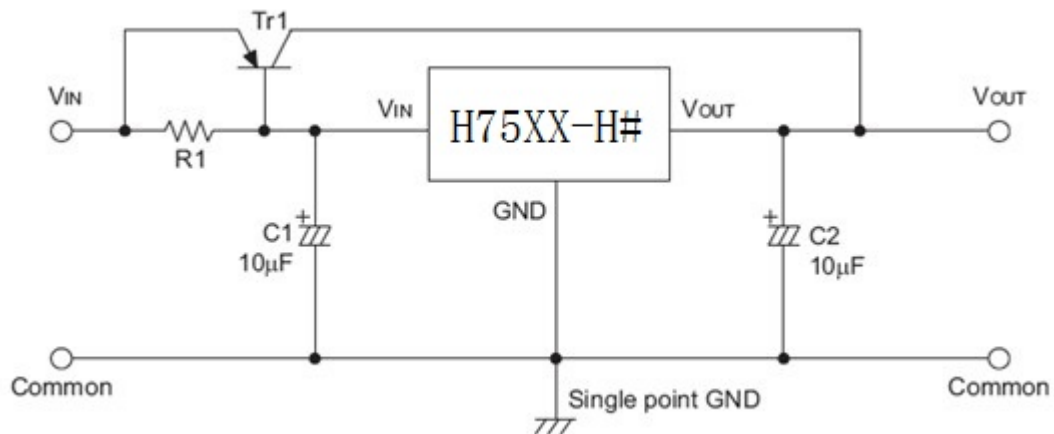
Basic Circuits



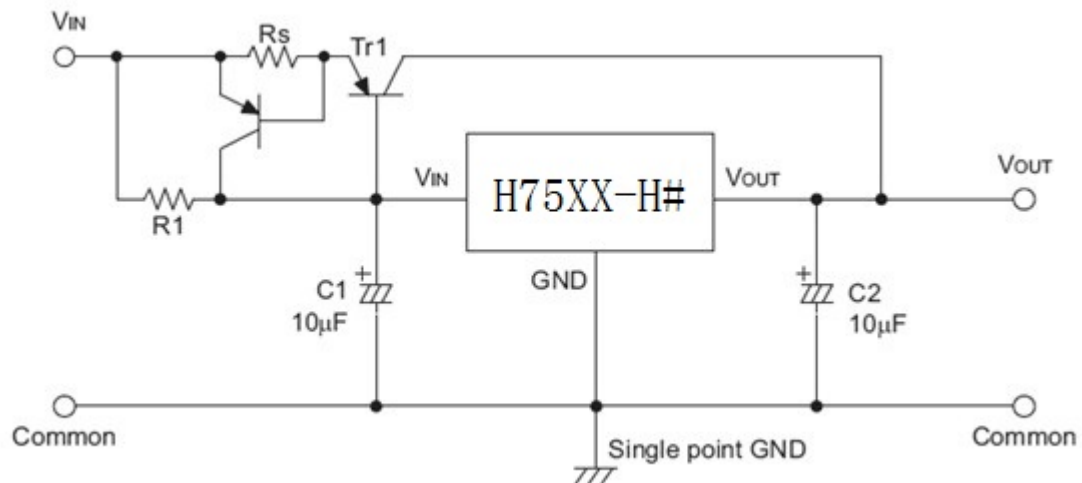
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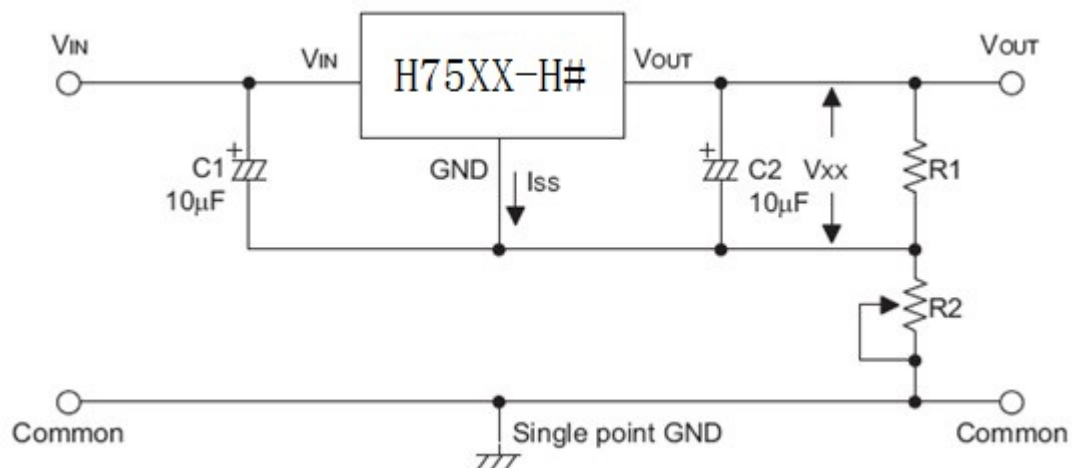
High Output Current Positive Voltage Regulator



Short-Circuit Protection by $Tr1$



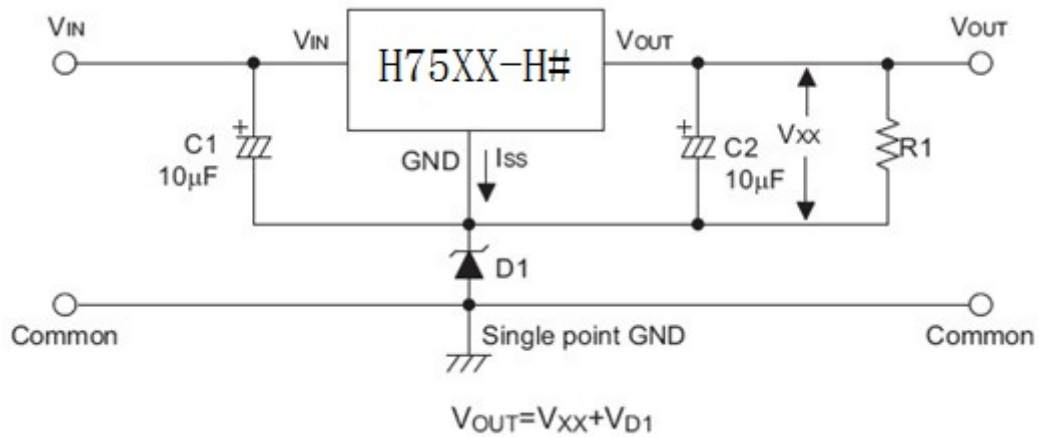
Circuit for Increasing Output Voltage



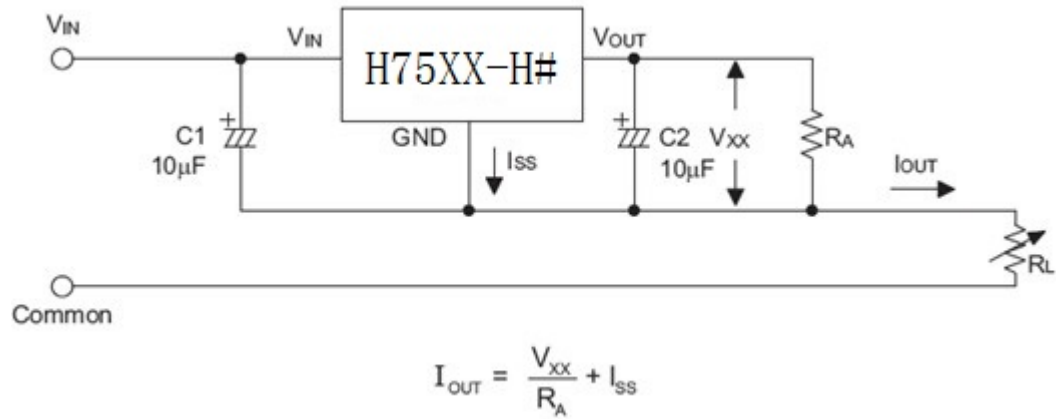
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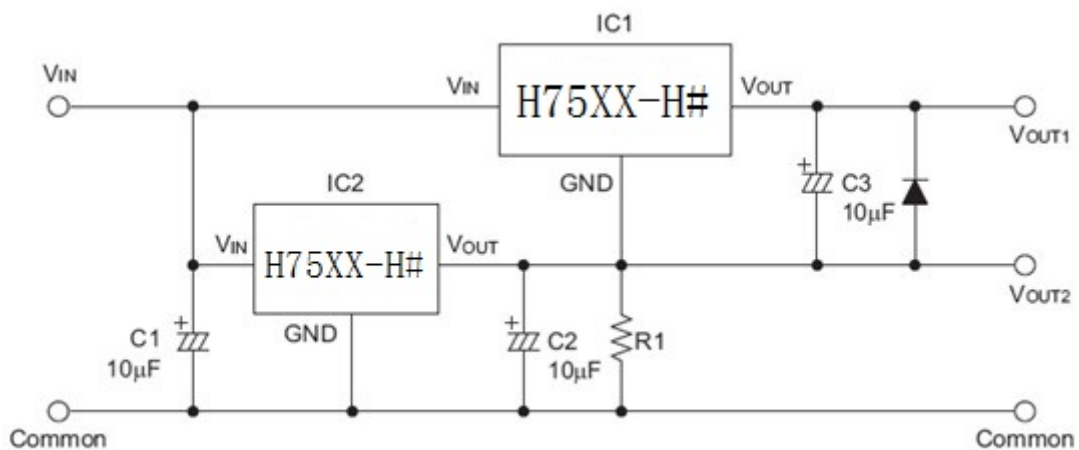
Circuit for Increasing Output Voltage



Constant Current Regulator



Dual Supply

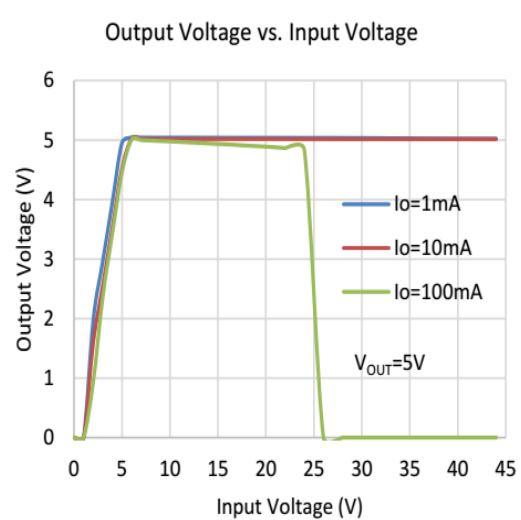
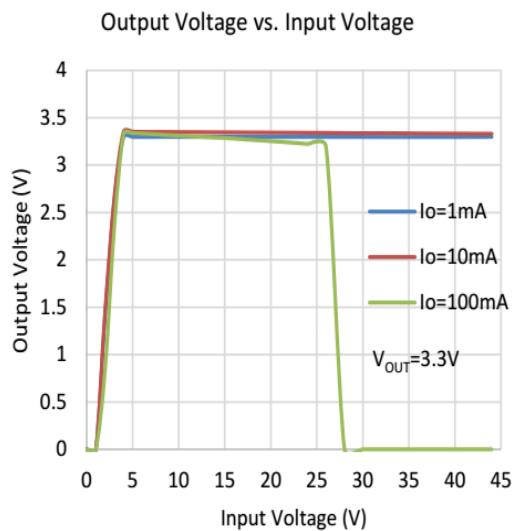
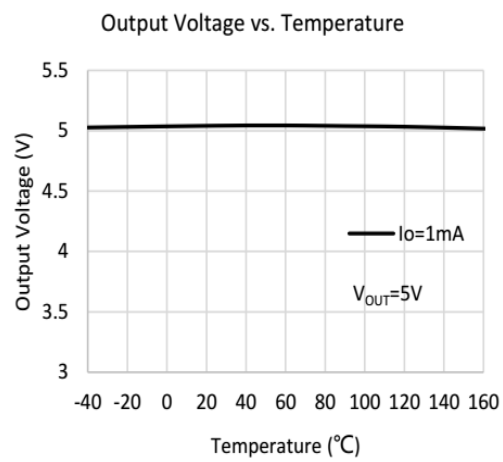
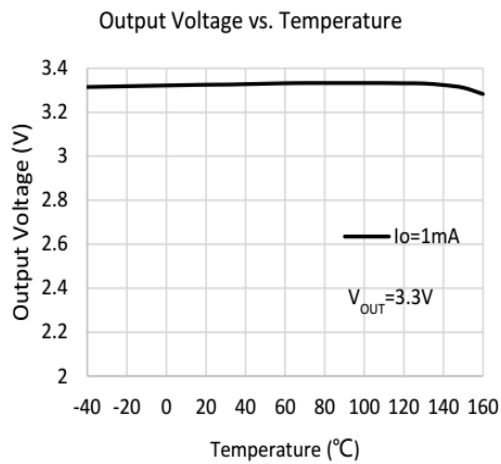
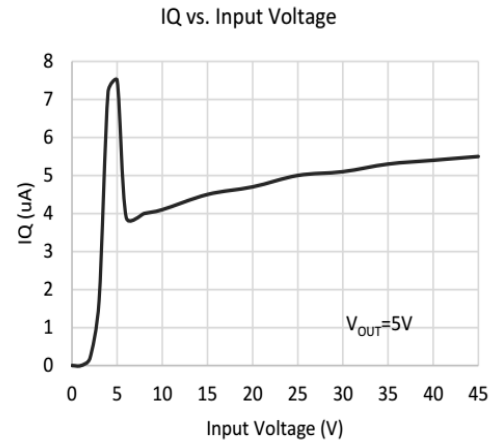
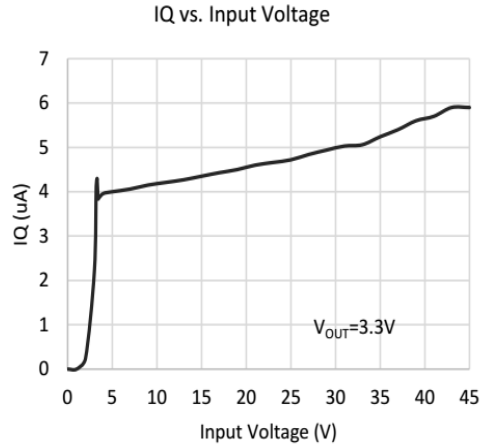


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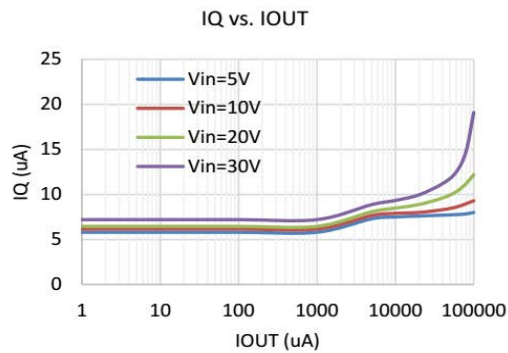
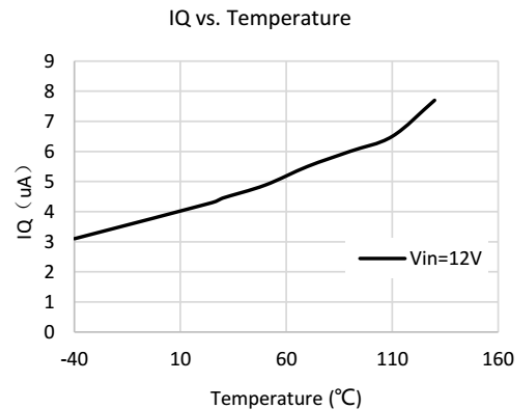
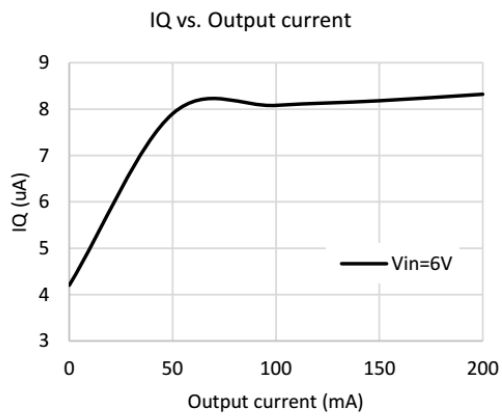
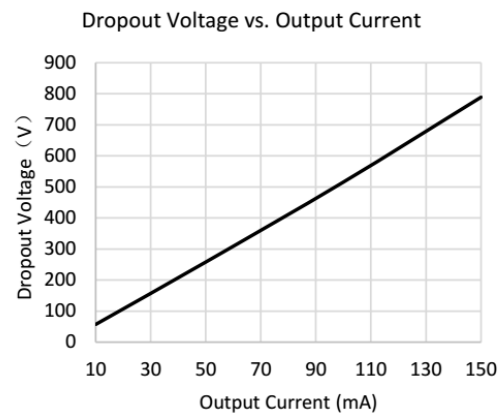
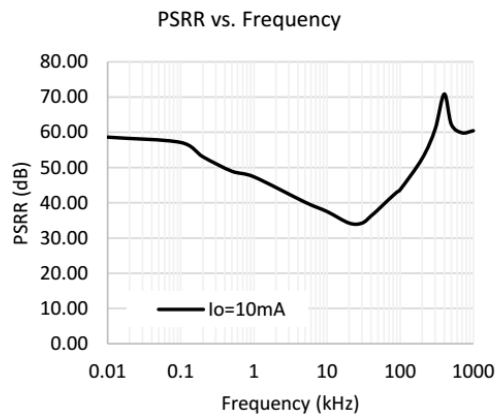
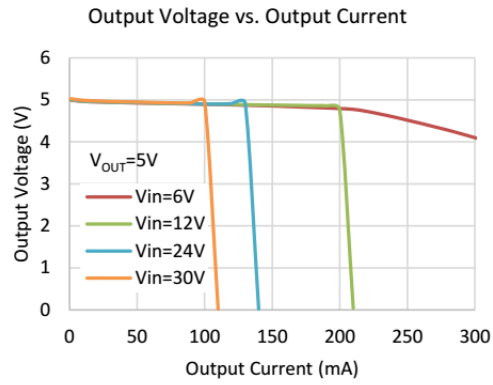
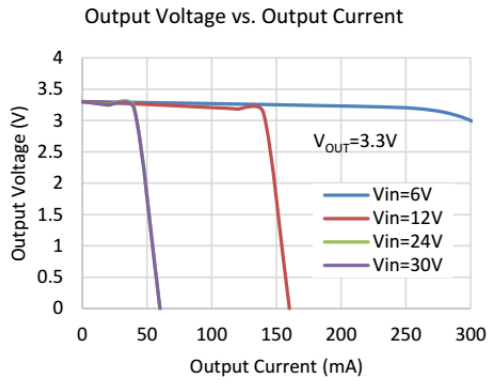
Typical Performance Characteristics

$C_{IN} = 10\mu F$, $C_{OUT} = 10\mu F$, $T_{OPT} = 25^\circ C$, unless specified otherwise. (Package: SOT89-3L)



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Power ON/OFF

CH1: V_{IN} CH2: V_{OUT}

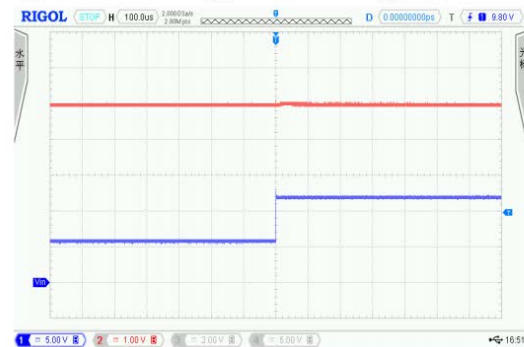
$V_{IN}=40V$ $I_{OUT}=1mA$ $V_{OUT}=5V$



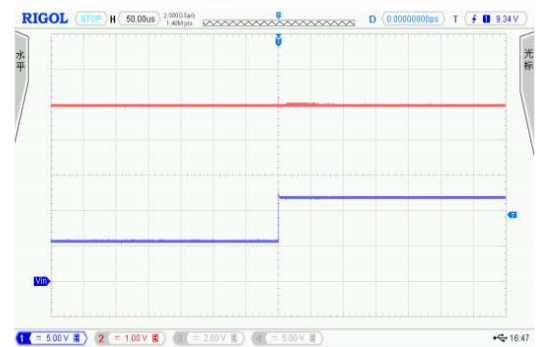
Line Transient

CH1: V_{IN} CH2: V_{OUT}

$V_{IN}=6V-12V$ $I_{OUT}=1mA$ $V_{OUT}=5V$



$V_{IN}=6V-12V$ $I_{OUT}=10mA$ $V_{OUT}=5V$

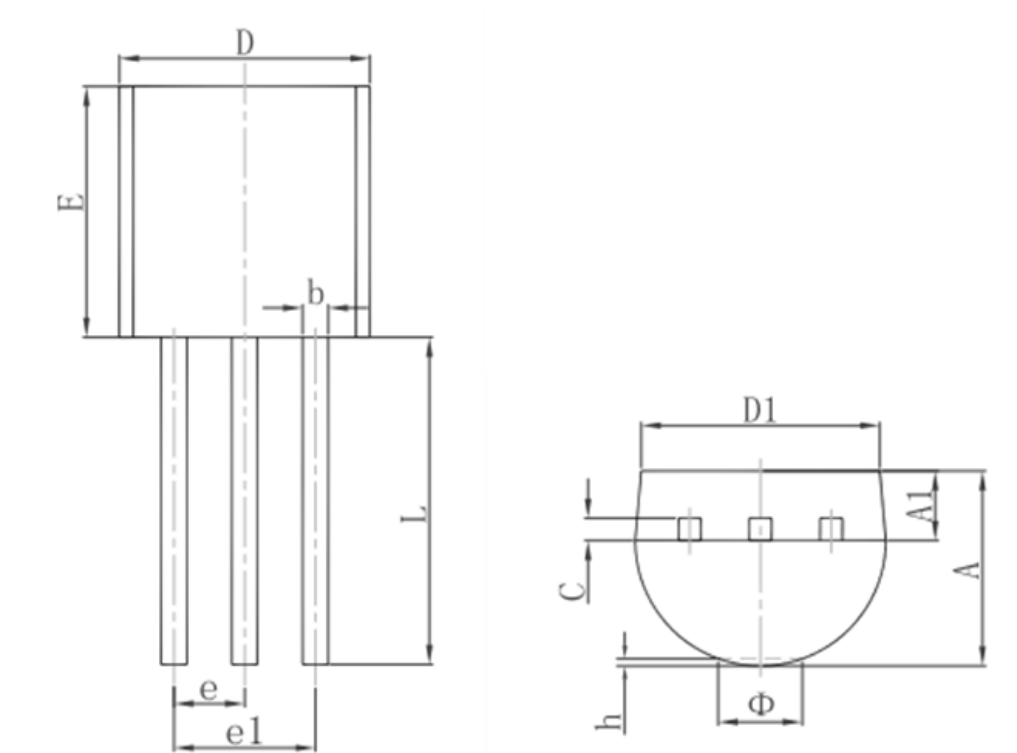


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Package Information

3-pin TO92 Outline Dimensions

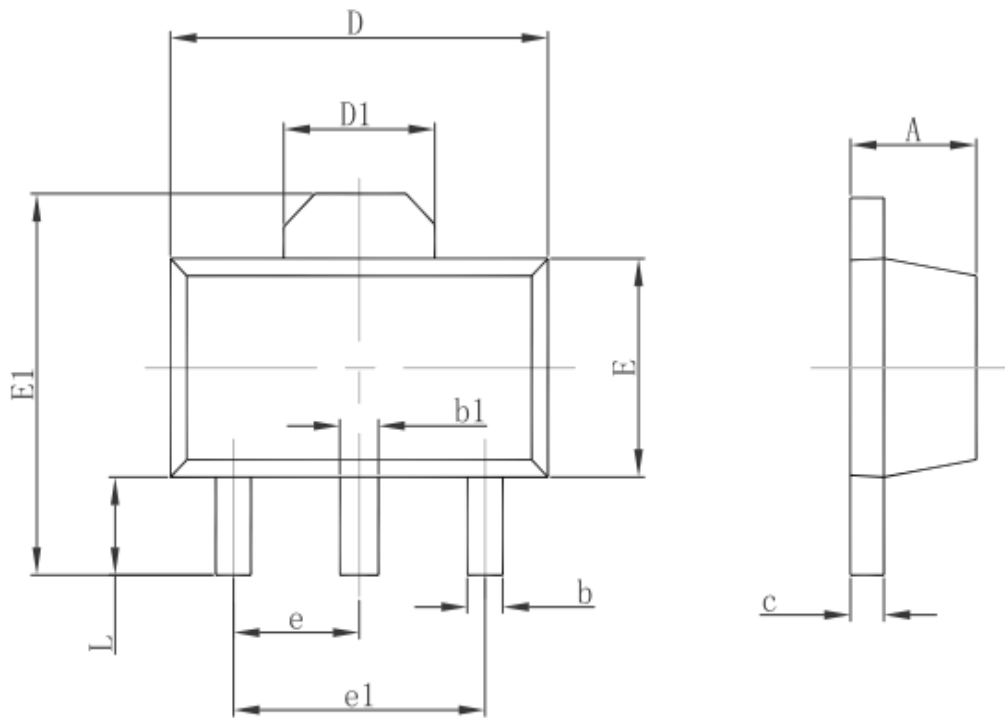


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.300	4.700	0.169	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270 TYP.		0.050 TYP.	
e1	2.440	2.640	0.096	0.104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

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3-pin SOT89 Outline Dimensions



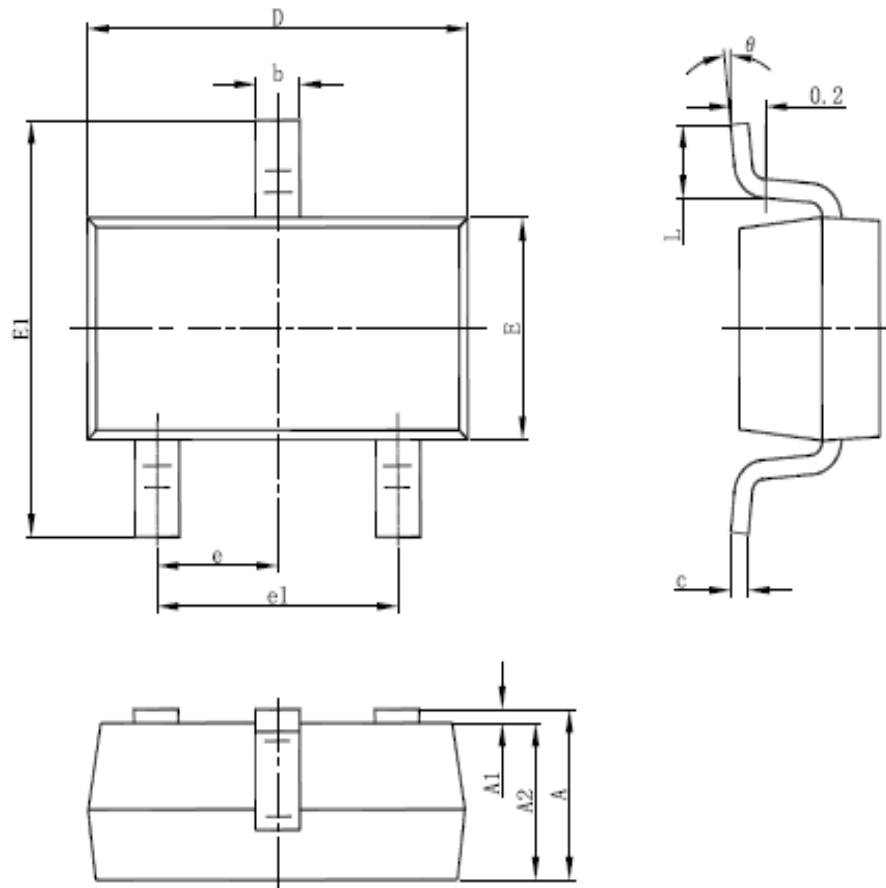
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.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

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3-pin SOT23-3 Outline Dimensions

SOT-23-3L PACKAGE 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°