

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:150mA(Typ.)
- TO92 , SOT89 and SOT23-3 package

Applications

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

General Description

The HM75XXHB series is a set of three-terminal low technology ensures low voltage drop and low power high voltage regulators implemented in quiescent current. Although designed primarily as CMOS technology. They allow input voltages as fixed voltage regulators, these devices can be high as 40V. They are available with several fixed used with external components to obtain variable output voltages ranging from 1.8V to 5.0V. CMOS voltages and currents.

Selection Table

Part No.	Output Voltage	Package	Marking
HM7518HBxx	1.8V	TO92 SOT89 SOT23-3	75XX-H#(for TO92) 75XX-H#(for SOT89) XXH (for SOT23-3)
HM7525HBxx	2.5V		
HM7527HBxx	2.7V		
HM7530HBxx	3.0V		
HM7533HBxx	3.3V		
HM7536HBxx	3.6V		
HM7540HBxx	4.0V		
HM7544HBxx	4.4V		
HM7550HBxx	5.0V		

Note:"XX" stands for package.

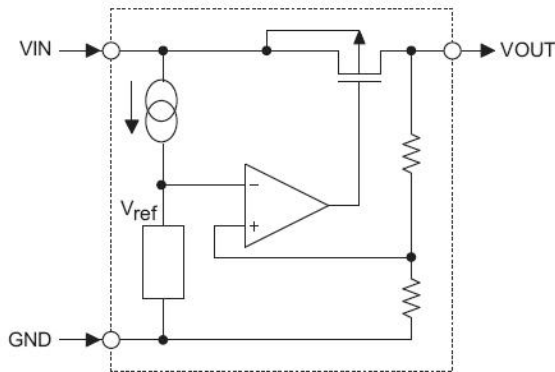
TO92 & SOT89 packages will add a "#" mark at the end of the marking.

Order Information

HM75①②③④⑤

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

Block Diagram



Pin Assignment

SOT23-3 (Top View)

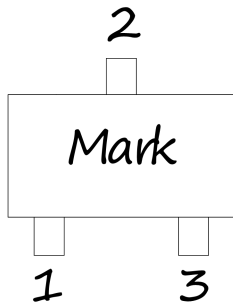


Table1:HM75XXHB series (SOT23-3 PKG)

PIN NO.	PIN NAME	FUNCTION
1	GND	GND pin
2	VIN	Input voltage pin
3	VOUT	Output voltage pin

SOT89 (Top View)

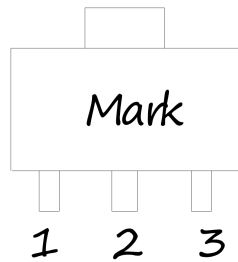


Table2:HM75XXHB series (SOT89 PKG)

PIN NO.	PIN NAME	FUNCTION
1	GND	GND pin
2	VIN	Input voltage pin
3	VOUT	Output voltage pin

TO92 (Top View)



Table3:HM75XXHBseries (TO92 PKG)

PIN NO.	PIN NAME	FUNCTION
1	GND	GND pin
2	VIN	Input voltage pin
3	VOUT	Output voltage pin

Absolute Maximum Ratings

Supply Voltage-0.3V to 40V 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.

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		mA
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	mV
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/ $^\circ C$

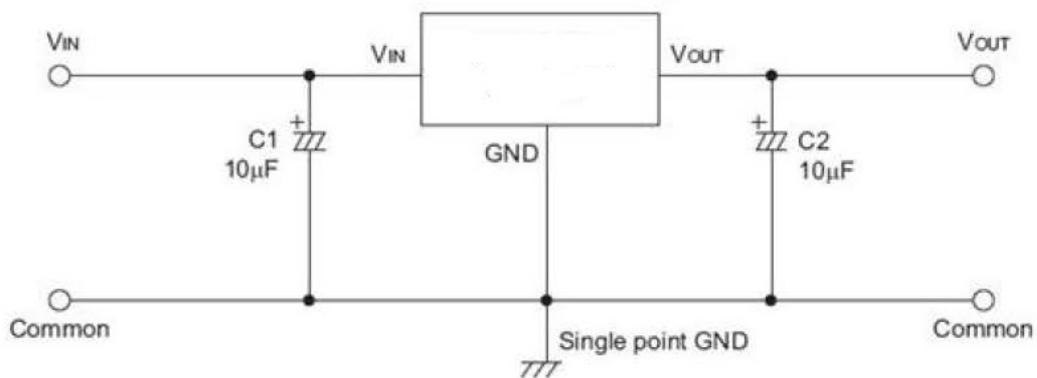
Thermal Information

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
		SOT23-3	500	°C/W
P_D	Power Dissipation	TO92	0.50	W
		SOT89	0.50	W
		SOT23-3	0.20	W

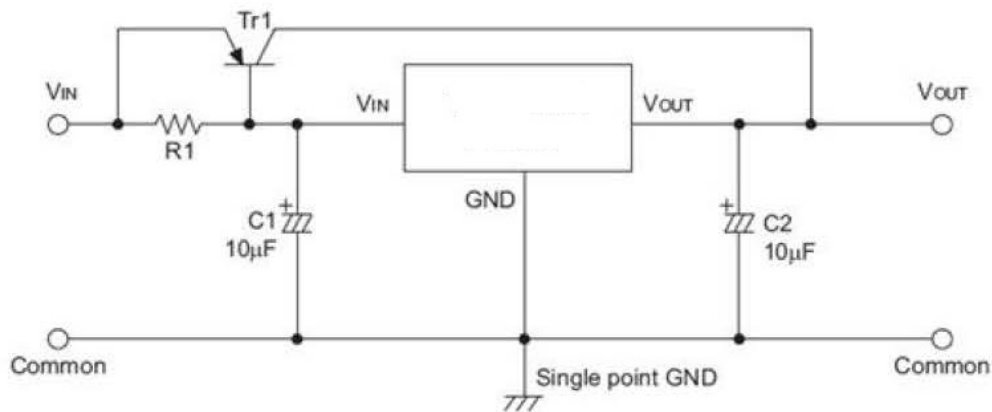
Note: P_D is measured at $T_a = 25^\circ\text{C}$

Application Circuits

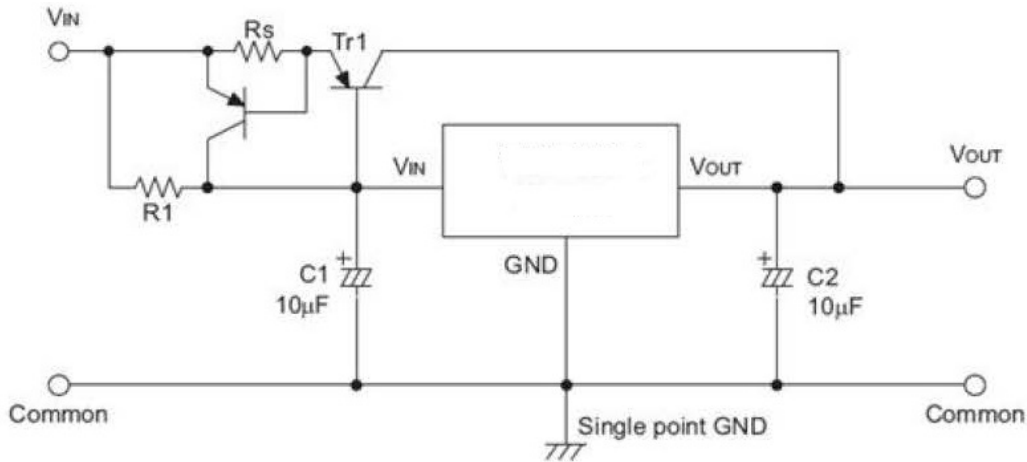
Basic Circuits



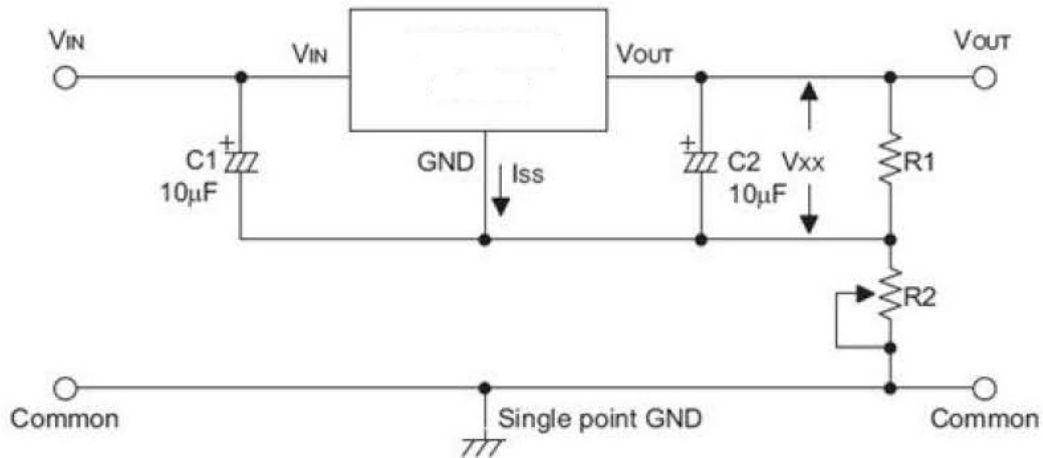
High Output Current Positive Voltage Regulator



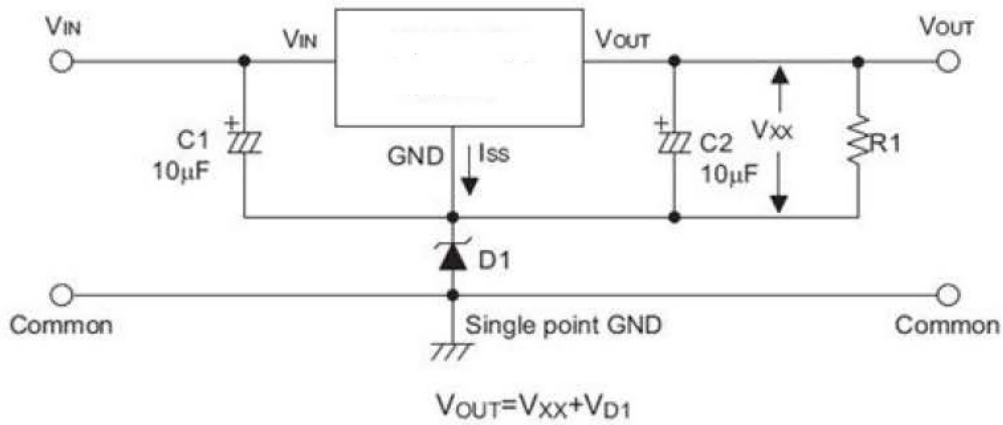
Short-Circuit Protection by Tr1



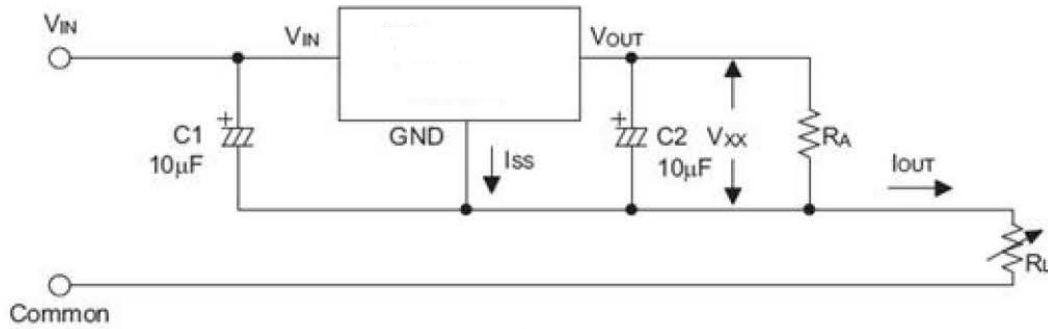
Circuit for Increasing Output Voltage



Circuit for Increasing Output Voltage



Constant Current Regulator

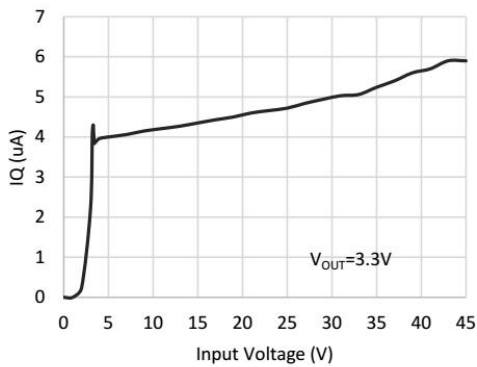


$$I_{OUT} = \frac{V_{XX}}{R_A} + I_{SS}$$

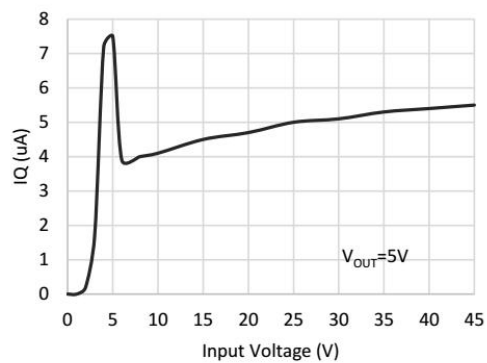
Typical Performance Characteristics

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

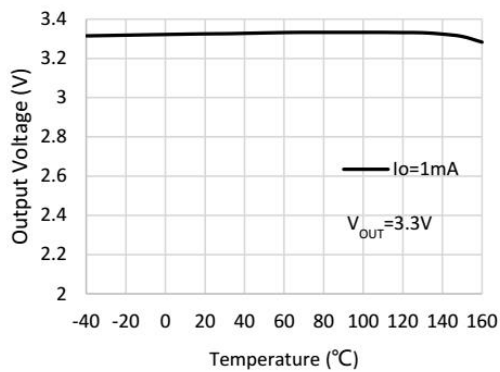
IQ vs. Input Voltage



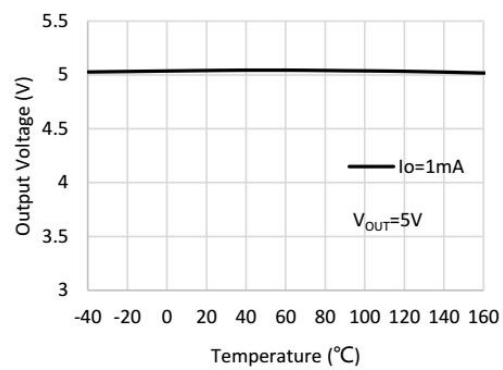
IQ vs. Input Voltage

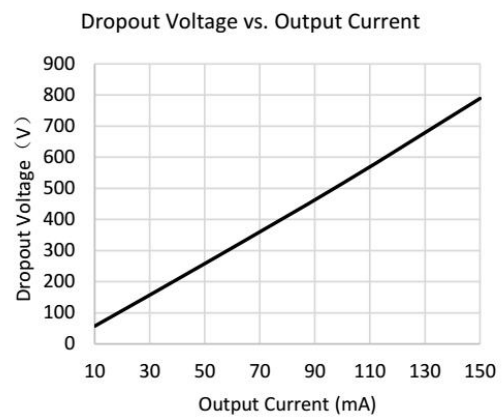
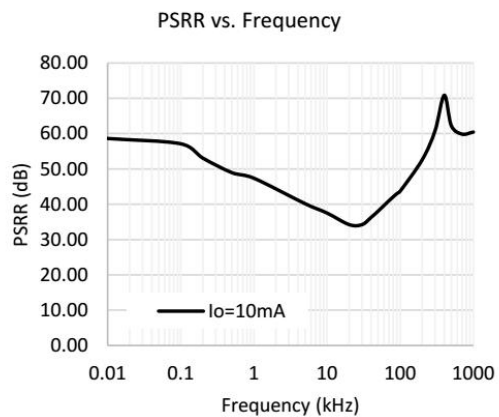
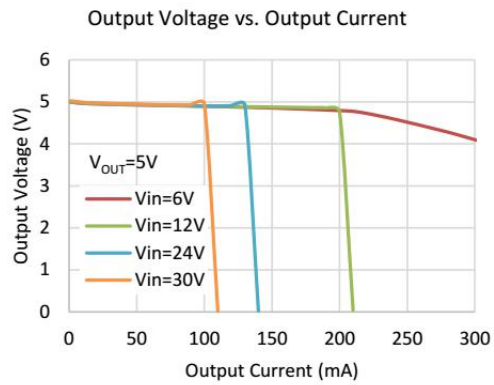
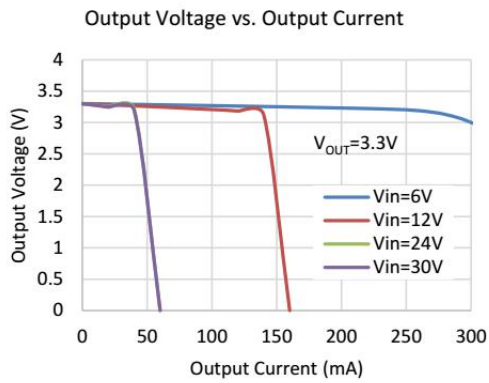
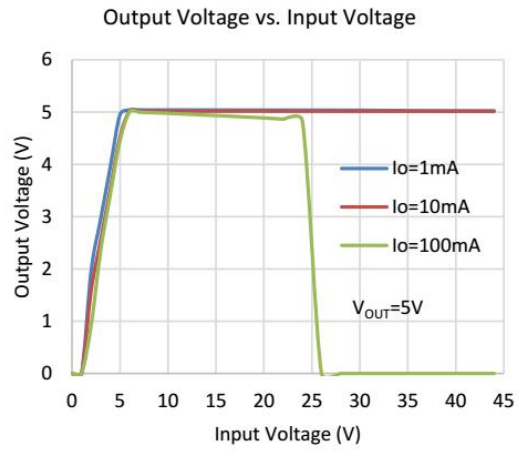
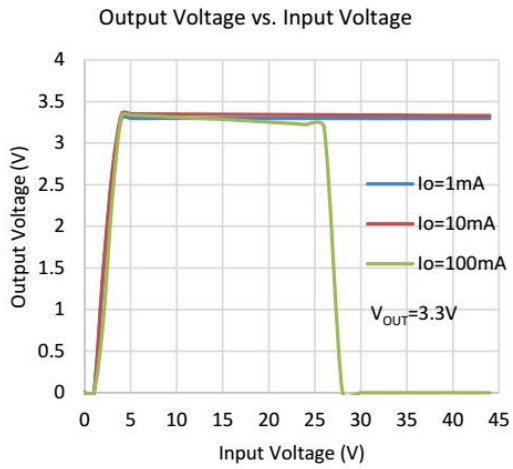


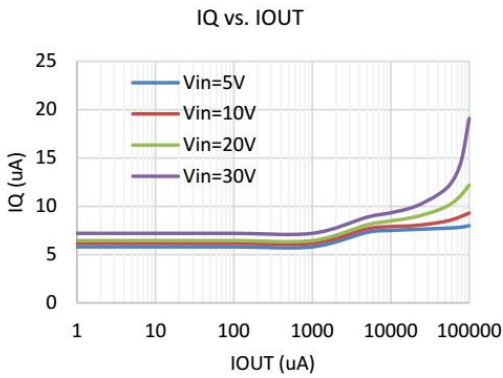
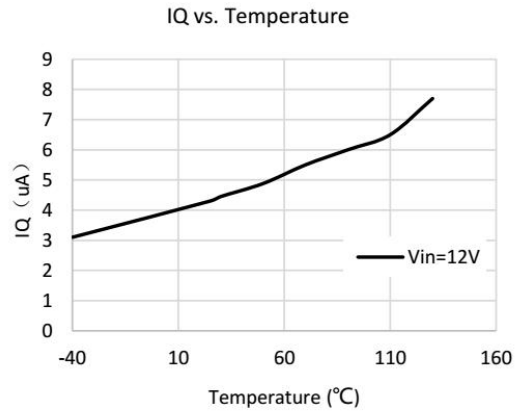
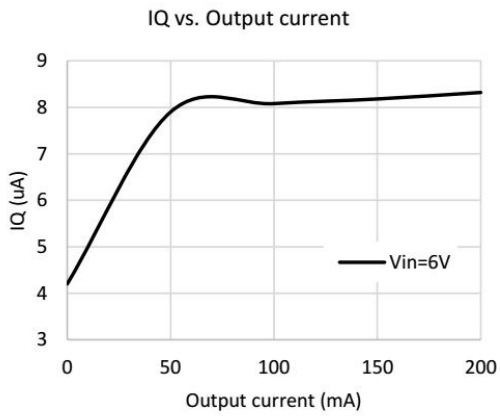
Output Voltage vs. Temperature



Output Voltage vs. Temperature







Power ON/OFF

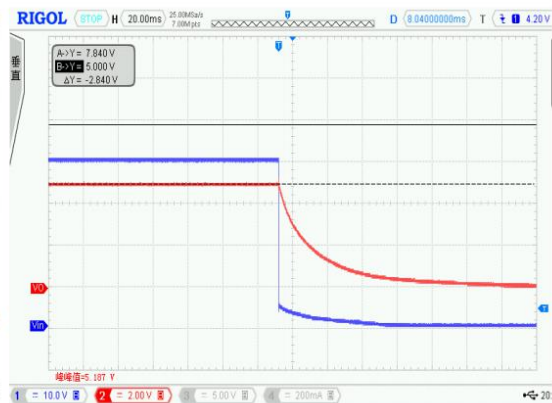
CH1: V_{IN}

CH2: V_{OUT}

$V_{IN}=40V$

$I_{OUT}=1mA$

$V_{OUT}=5V$



Line Transient

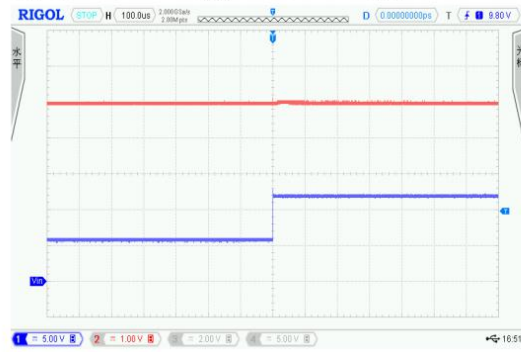
CH1: V_{IN}

CH2: V_{OUT}

$V_{IN}=6V-12V$

$I_{OUT}=1mA$

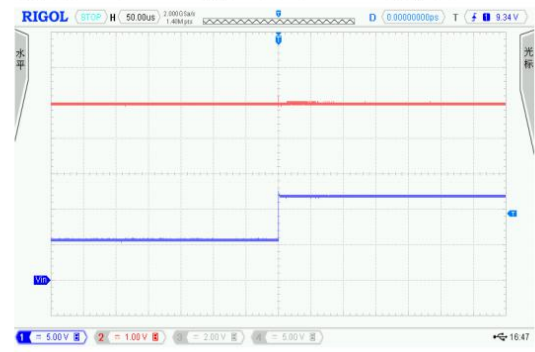
$V_{OUT}=5V$



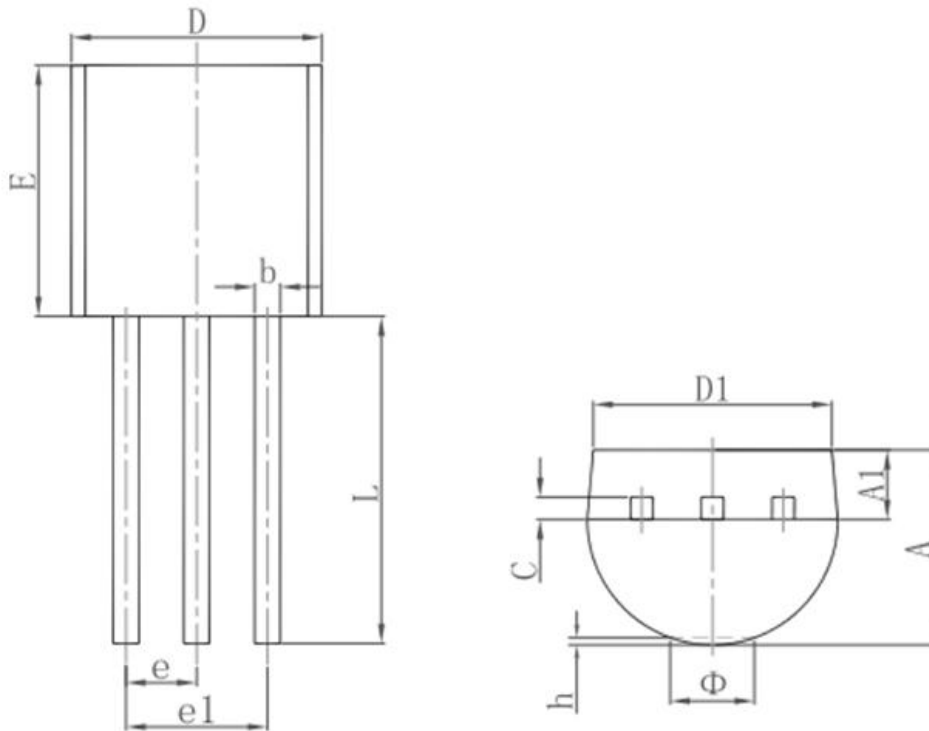
$V_{IN}=6V-12V$

$I_{OUT}=10mA$

$V_{OUT}=5V$

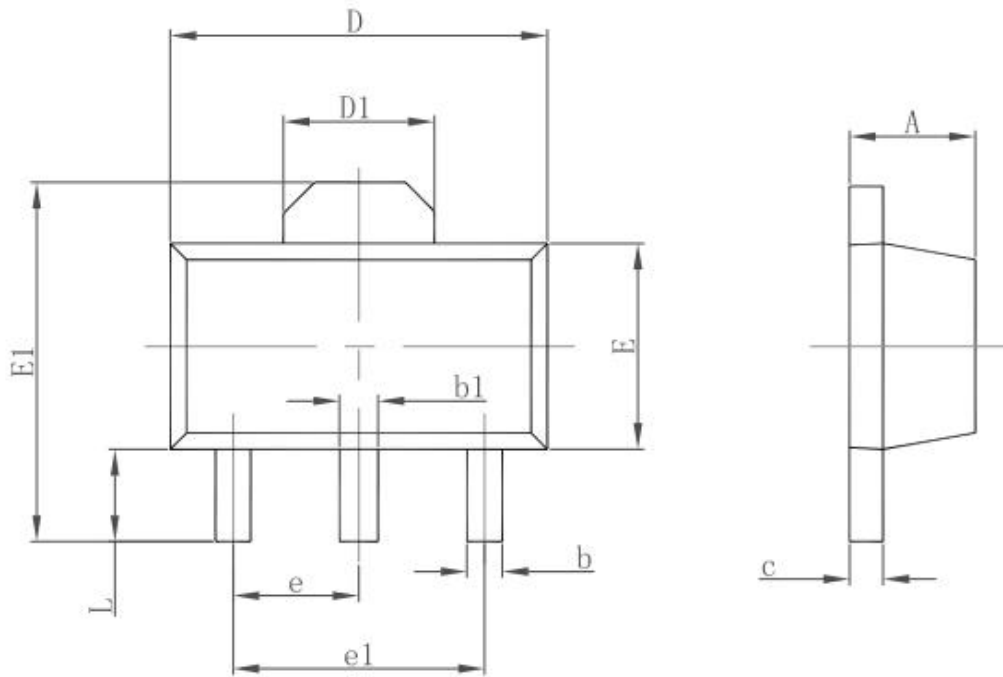


Package Information
3-pin TO92 Outline Dimensions



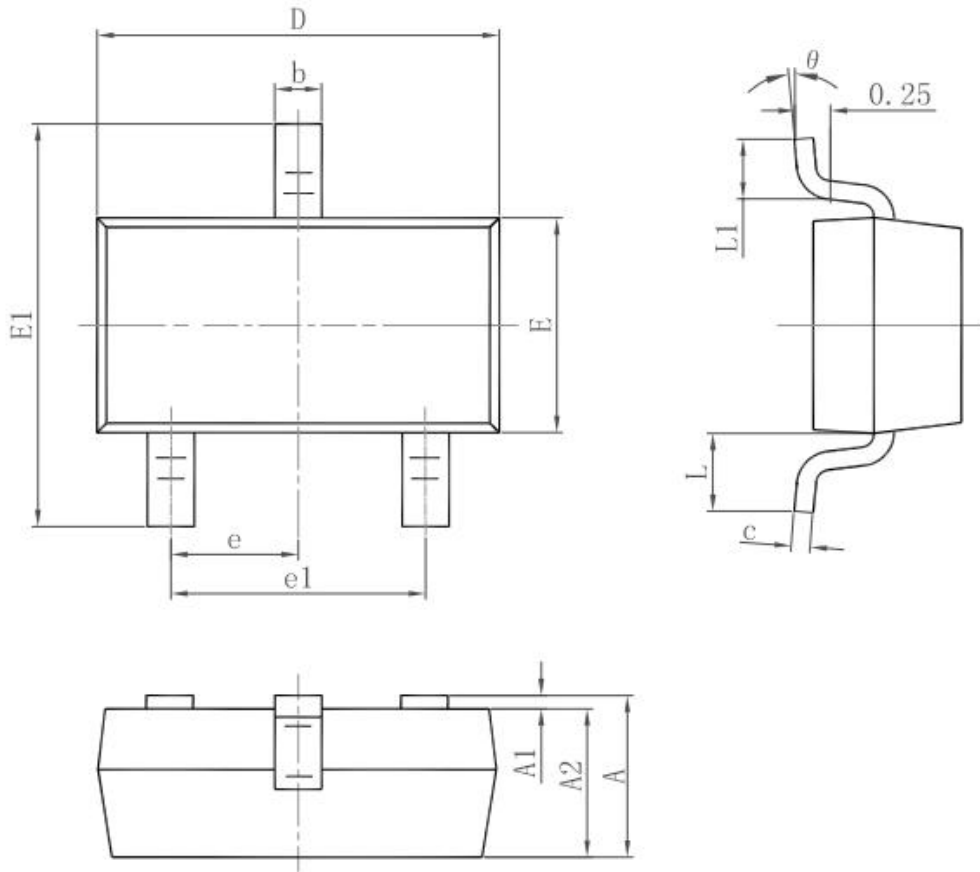
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.300	4.700	0.169	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270 TYP.		0.050 TYP.	
e1	2.440	2.640	0.096	0.104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

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
theta	0°	8°	0°	8°