

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,SOT23-3,SOT23-5 and SOT23-5B package

Applications

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

General Description

The ASPL75XXH 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
ASPL7518Hxx	1.8V	TO92 SOT89 SOT23-3 SOT23-5 SOT23-5B	75XX-H#(for TO92) 75XX-H#(for SOT89) XXH(for SOT23-5&SOT23-3) XXBH(for SOT23-5B)
ASPL7525Hxx	2.5V		
ASPL7527Hxx	2.7V		
ASPL7530Hxx	3.0V		
ASPL7533Hxx	3.3V		
ASPL7536Hxx	3.6V		
ASPL7540Hxx	4.0V		
ASPL7544Hxx	4.4V		
ASPL7550Hxx	5.0V		

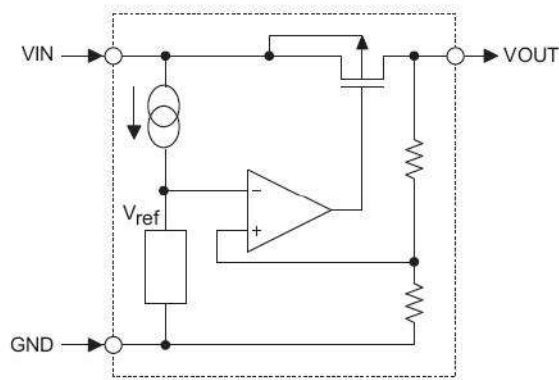
Note:"XX" stands for output voltages.

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

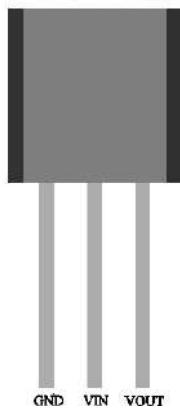
Order Information

ASPL75①②③④⑤

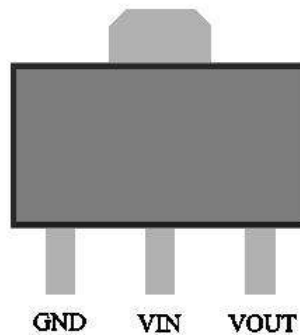
Designator	Symbol	Description
① ②	Integer	Output Voltage(1.8~5.0V)
③	H	Standard
④	LP	Package:TO-92
	DI	Package:SOT89
	ZB	Package:SOT23-3
	ZD	Package:SOT23-5
	ZDB	Package:SOT23-5B
⑤	R	RoHS / Pb Free
	G	Halogen Free

**Block Diagram****Pin Assignment**

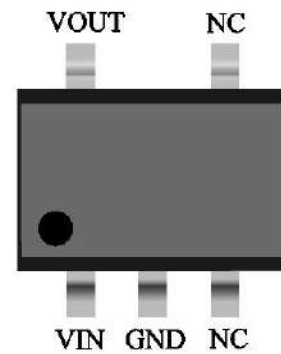
TO92 (Front view)

**ASPL75XXHTG**

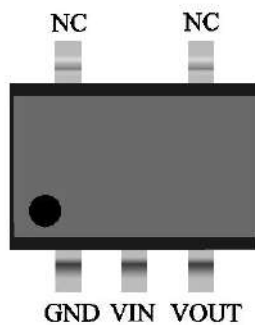
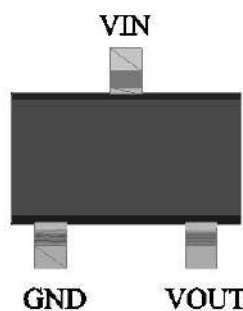
SOT89 (Top view)

**ASPL75XXHPG**

SOT23-5 (Top view)

**ASPL75XXHM5G**

SOT23-5B (Top view) SOT23-3 (Top view)

**ASPL75XXHM5BG****ASPL75XXHMG**

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.

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
		SOT23-5	500	°C/W
P_D	Power Dissipation	TO92	0.50	W
		SOT89	0.50	W
		SOT23-3	0.20	W
		SOT23-5	0.20	W

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

Electrical Characteristics

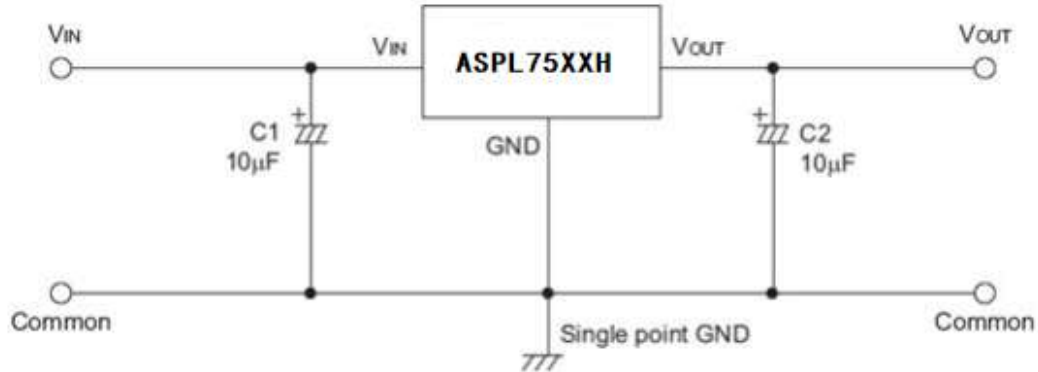
The following specifications apply for $V_{IN} = 12V$, $T_A = 25^{\circ}C$, $C_{IN} = C_{OUT} = 10\mu F$, unless specified otherwise.

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/ $^{\circ}C$

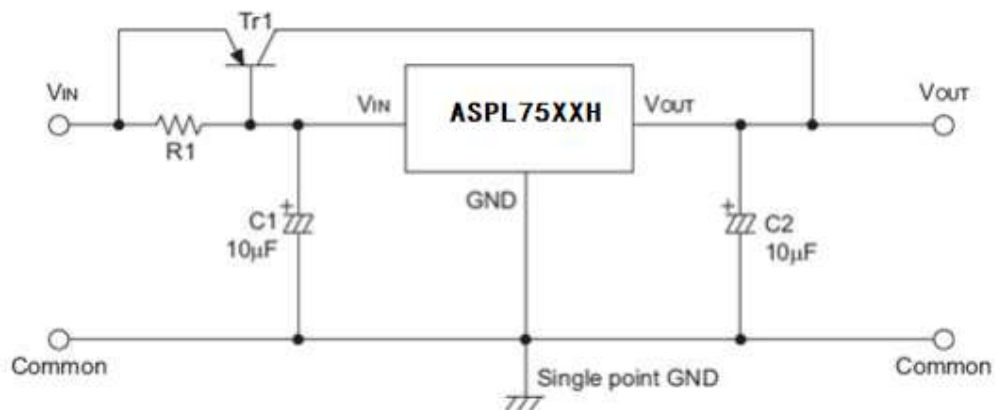


Application Circuits

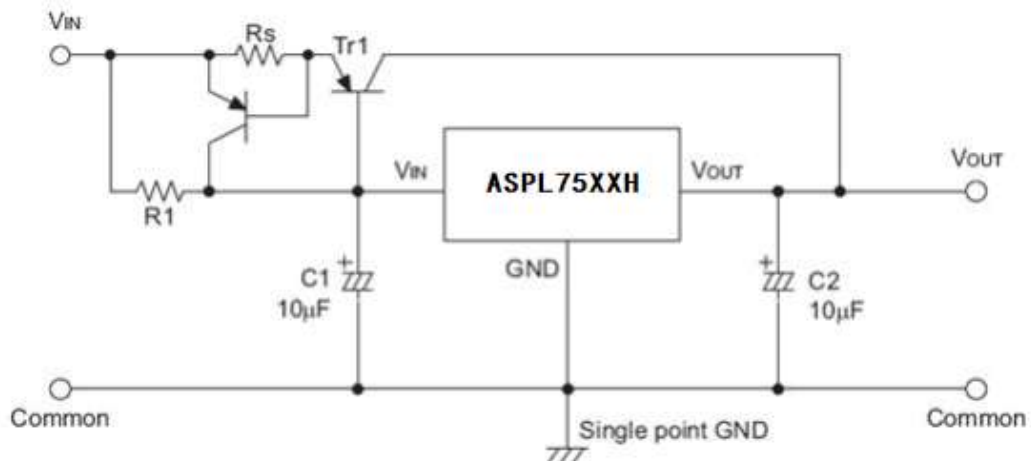
Basic Circuits

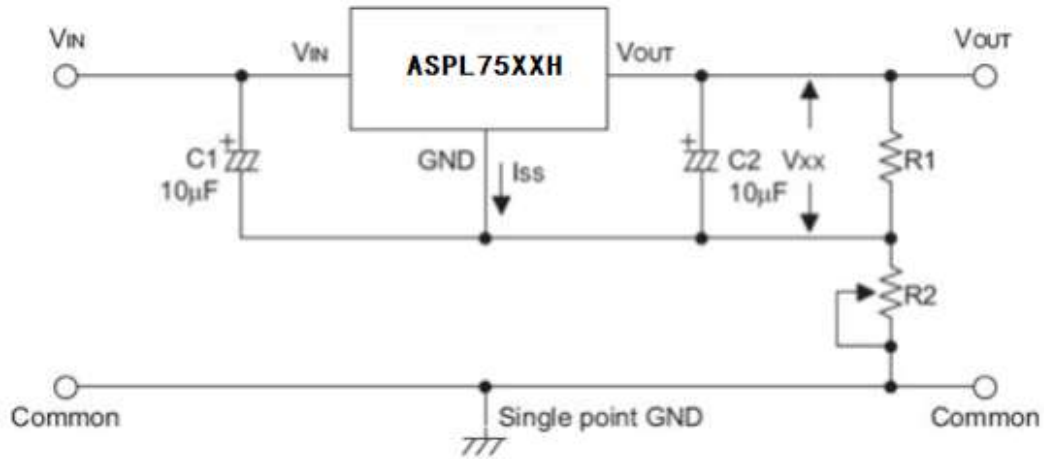
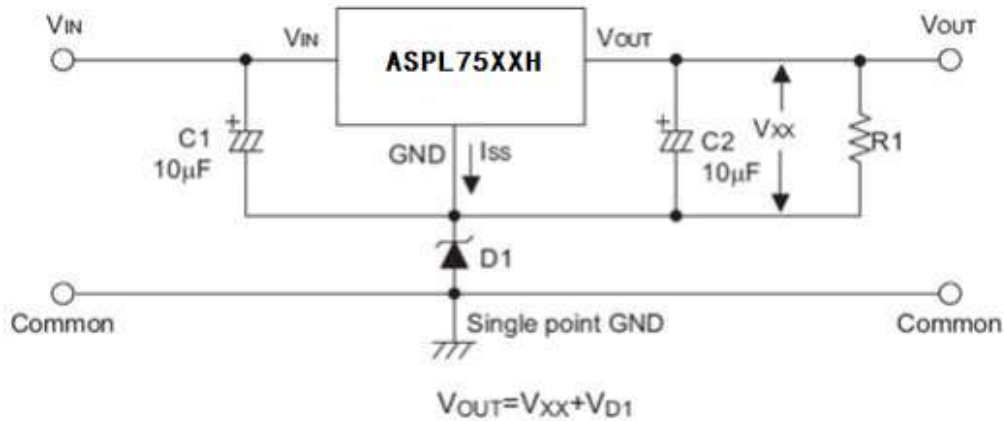
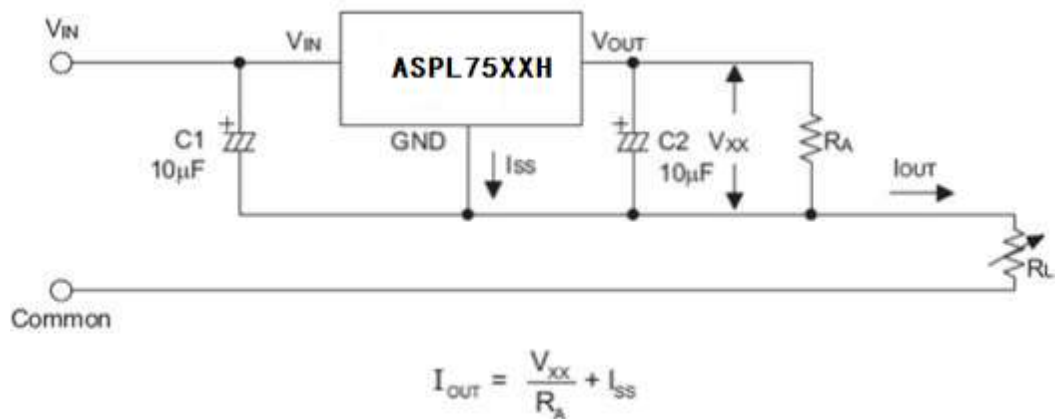


High Output Current Positive Voltage Regulator



Short-Circuit Protection by Tr1

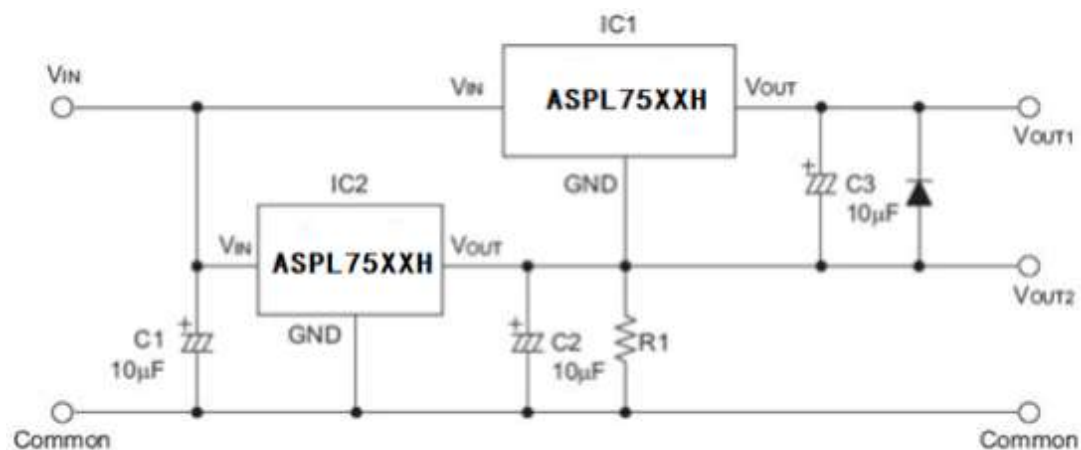


**Circuit for Increasing Output Voltage****Circuit for Increasing Output Voltage****Constant Current Regulator**



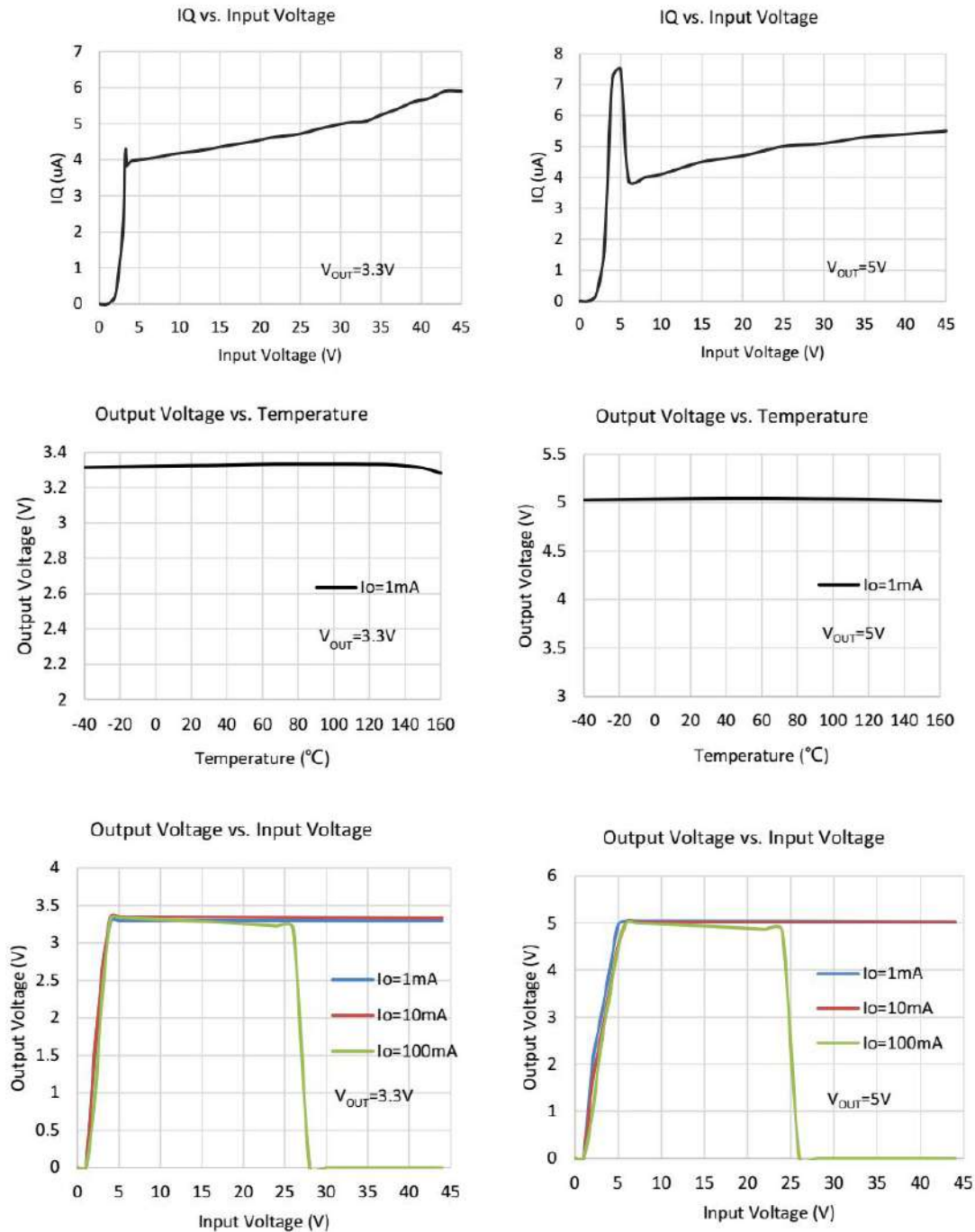
100mA Low Power LDO

Dual Supply



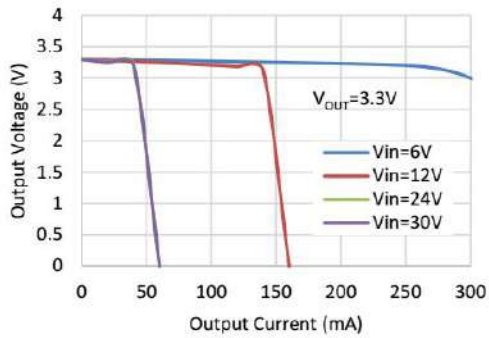
Typical Performance Characteristics

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

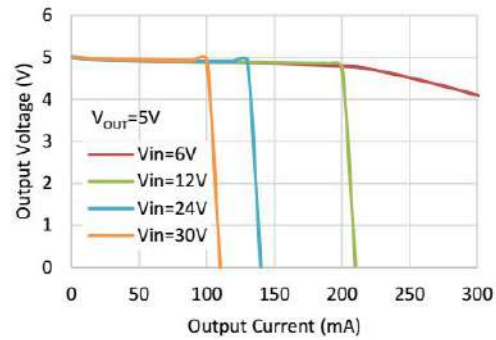




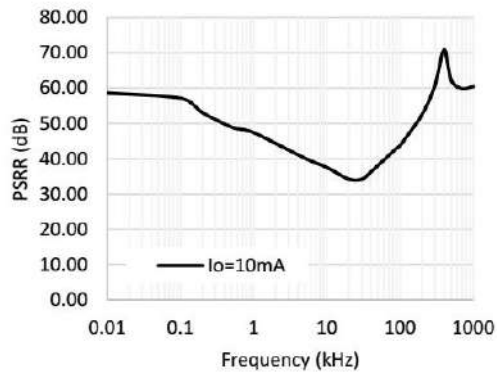
Output Voltage vs. Output Current



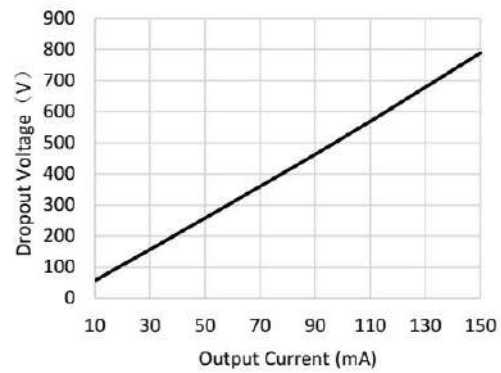
Output Voltage vs. Output Current



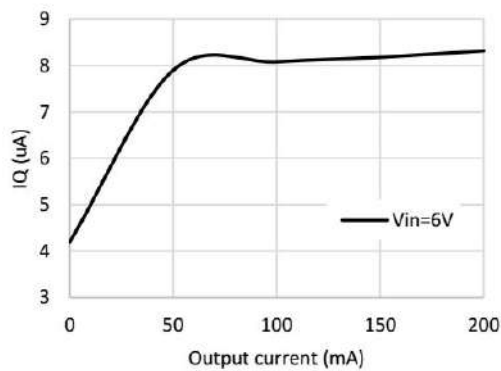
PSRR vs. Frequency



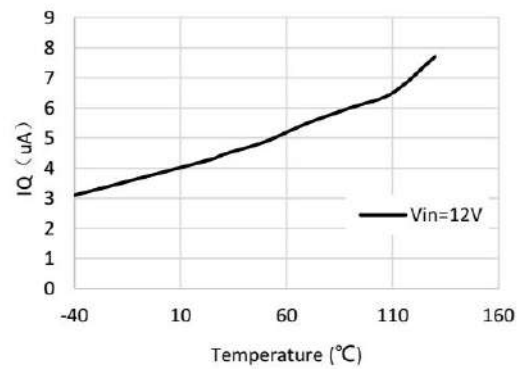
Dropout Voltage vs. Output Current

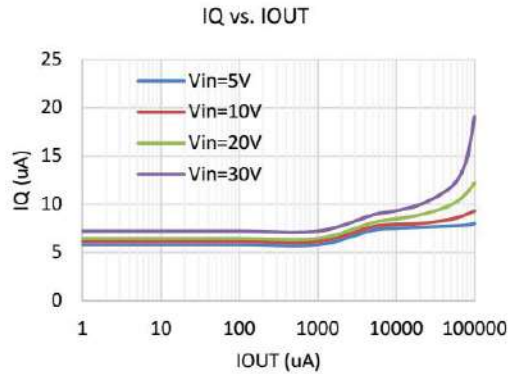


IQ vs. Output current



IQ vs. Temperature





Power ON/OFF

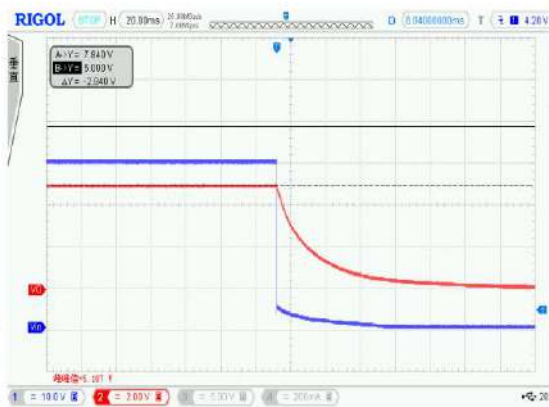
CH1: V_{IN}

CH2: V_{OUT}

$V_{IN}=40V$

$I_{OUT}=1mA$

$V_{OUT}=5V$



Line Transient

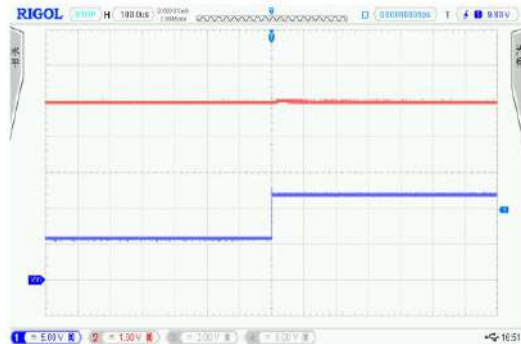
CH1: V_{IN}

CH2: V_{OUT}

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

$I_{OUT}=1mA$

$V_{OUT}=5V$

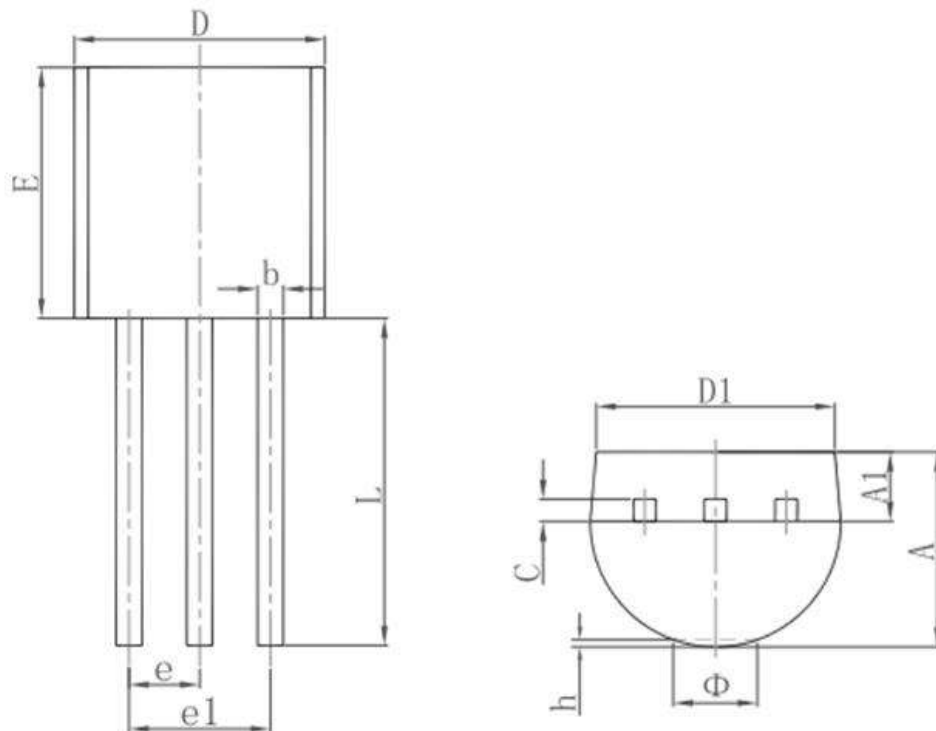


$V_{IN}=6V-12V$

$I_{OUT}=10mA$

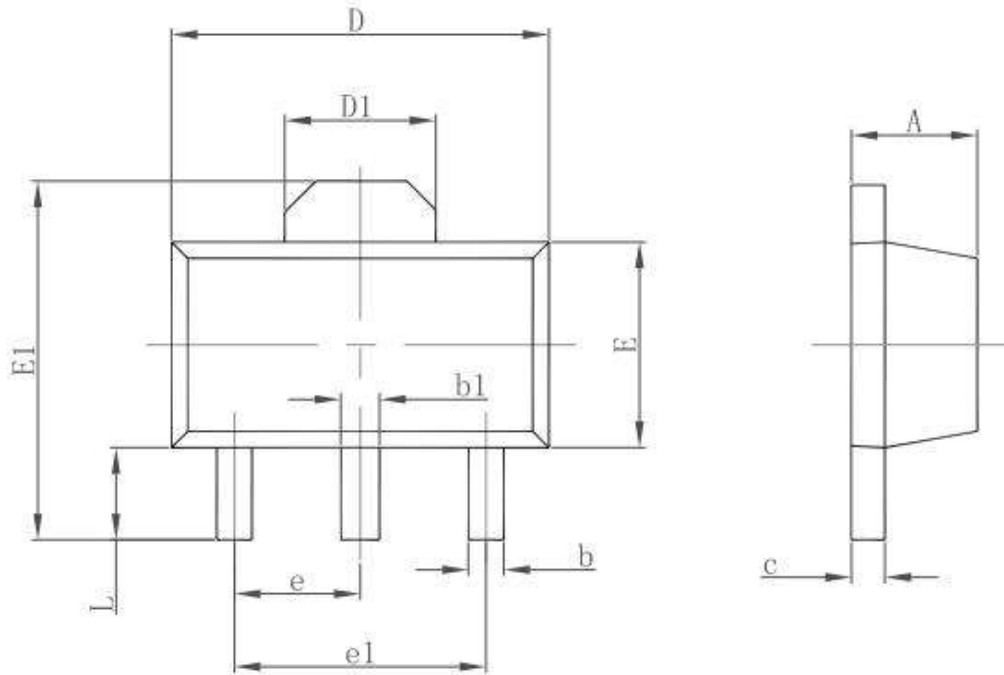
$V_{OUT}=5V$



**Package Information**
3-pin TO92 Outline Dimensions

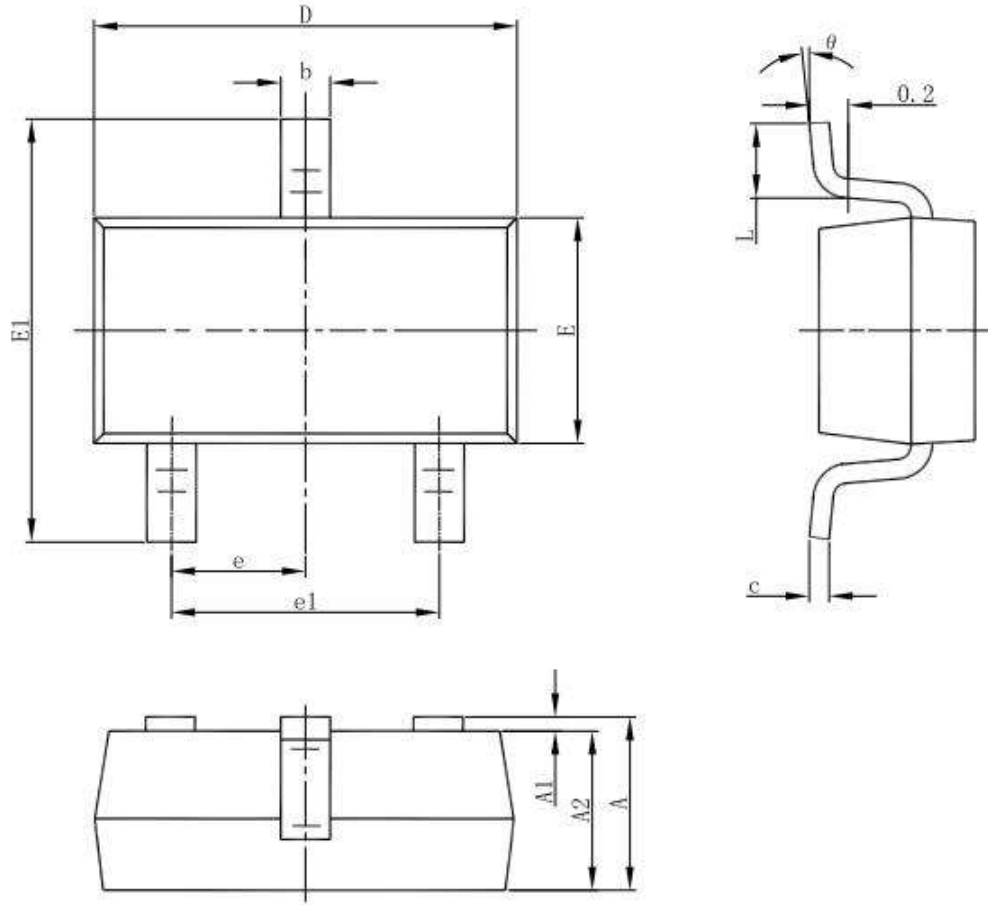
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.300	4.700	0.169	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270 TYP.		0.050 TYP.	
e1	2.440	2.640	0.096	0.104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



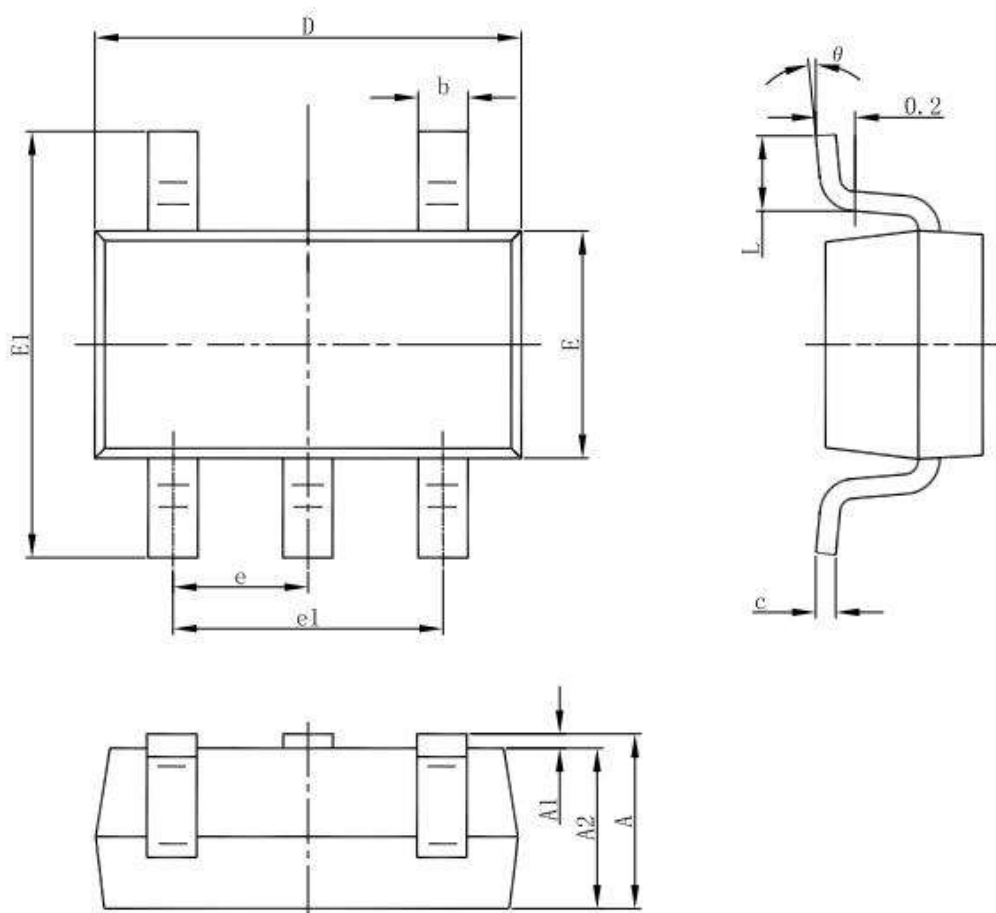
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.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

3-pin SOT23-3 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°

SOT23-5 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°

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