



### 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,SOT89B,SOT23-3,SOT23-5 and SOT23-5B package

### Applications

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

### General Description

The MB75XXH 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
MB7518Hxx	1.8V	TO92 SOT89 SOT89B SOT23-3 SOT23-5 SOT23-5B	75XX-H#(for TO92) 75XX-H#(for SOT89) 75XX-BH#(for SOT89B) XXH(for SOT23-5&SOT23-3) XXBH(for SOT23-5B)
MB7525Hxx	2.5V		
MB7527Hxx	2.7V		
MB7530Hxx	3.0V		
MB7533Hxx	3.3V		
MB7536Hxx	3.6V		
MB7540Hxx	4.0V		
MB7544Hxx	4.4V		
MB7550Hxx	5.0V		

Note:"XX" stands for output voltages.

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

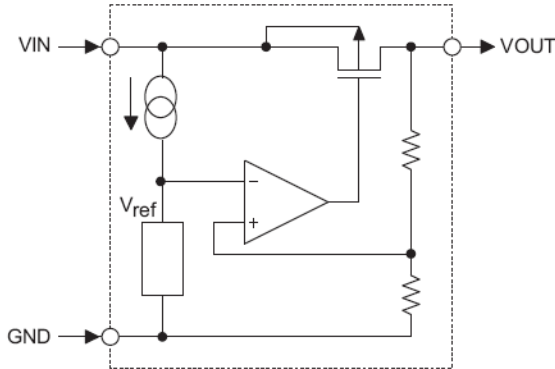
### Order Information

MB75①②③④⑤

Designator	Symbol	Description
① ②	Integer	Output Voltage(1.8~5.0V)
③	H	Standard
④	T	Package:TO-92
	P	Package:SOT89
	PB	Package:SOT89B
	M	Package:SOT23-3
	M5	Package:SOT23-5
	M5B	Package:SOT23-5B
⑤	G	Halogen Free

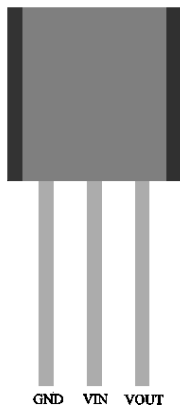


### Block Diagram



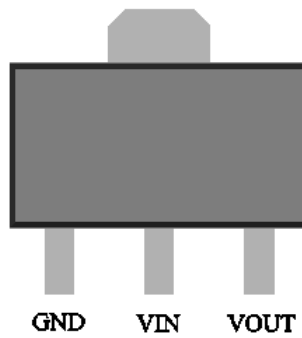
### Pin Assignment

TO92 (Front view)



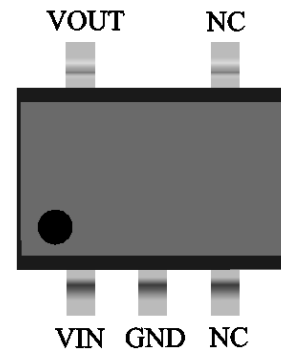
MB75XXHTG

SOT89 (Top view)



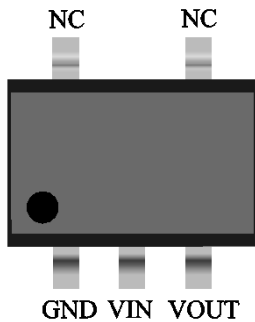
MB75XXHPG

SOT23-5 (Top view)



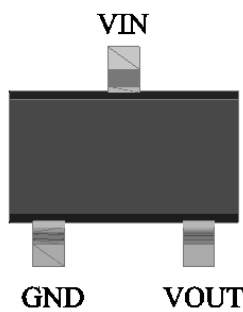
MB75XXHM5G

SOT23-5B (Top view)



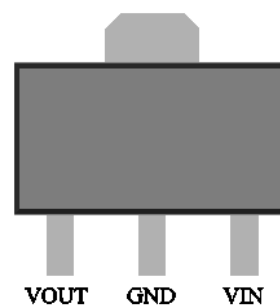
MB75XXHM5BG

SOT23-3 (Top view)



MB75XXHMG

SOT89B (Top view)



MB75XXHPBG



### 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
$\theta_{JA}$	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

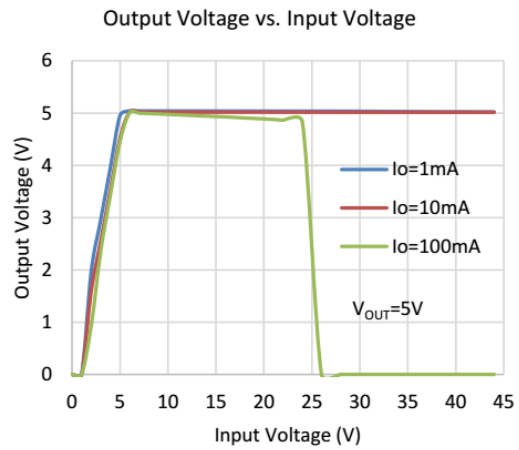
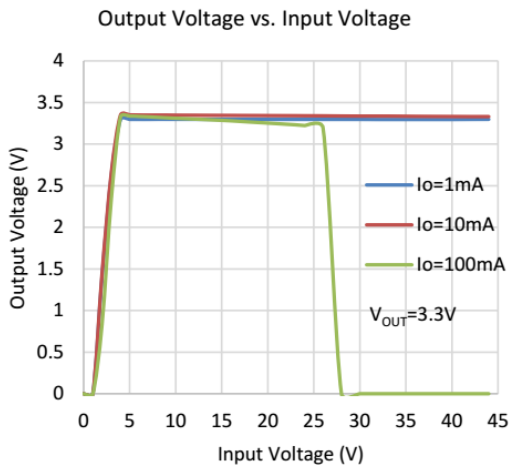
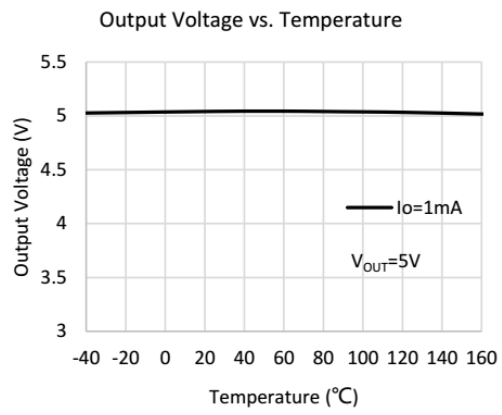
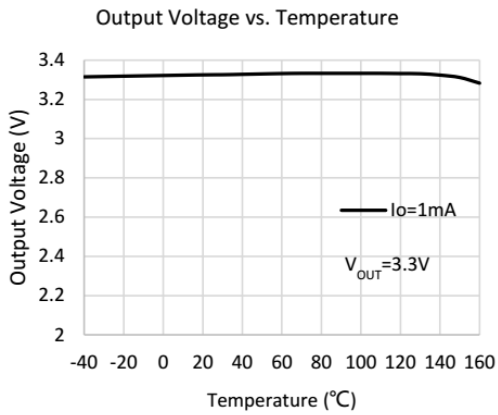
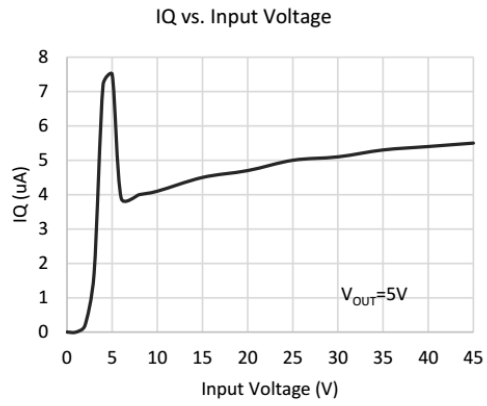
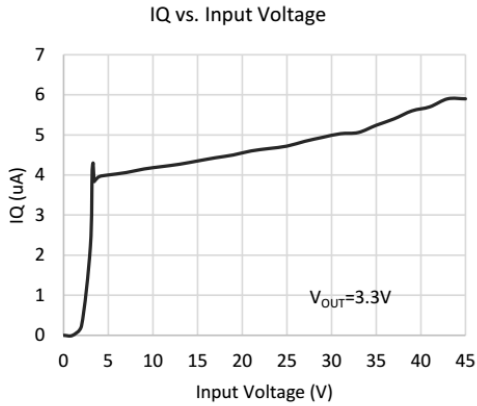
The following specifications apply for  $V_{IN} = 12V$ ,  $T_A = 25^\circ C$ ,  $C_{IN} = C_{OUT} = 10\mu F$ , unless specified otherwise.

SYMBOL	ITEMS	CONDITIONS	MIN	TYP	MAX	UNIT
$V_{IN}$	Input Range	$I_{OUT} = 30mA$	$V_{OUT} + 0.3$		40	V
$V_{OUT}$	Output Range	$I_{OUT} = 10mA$	$V_{OUT} \times 0.98$	$V_{OUT}$	$V_{OUT} \times 1.02$	V
$\Delta V_{OUT}$	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	$\mu A$
		$V_{IN} = 24V, I_{OUT} = 0$		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	
$\Delta V_{LINE}$	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	
$\Delta V_{LOAD}$	Load Regulation	$V_{IN} = 7V, I_{OUT} = 1 \sim 100mA$		19	37	mV
$I_{SHORT}$	Short Current	$V_{OUT}$ Short to GND with $1\Omega$ (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, $C_{OUT} = 10\mu F,$ $I_{OUT} = 10mA$		$\pm 100$		$\mu V_{RMS}$
$T_{SD}$	Thermal Shutdown Protection	$V_{IN} = 12V, I_{OUT} = 1mA$		165		$^\circ C$
$\Delta V_O / \Delta T$	Temperature Coefficient			$\pm 0.5$		mV/ $^\circ C$



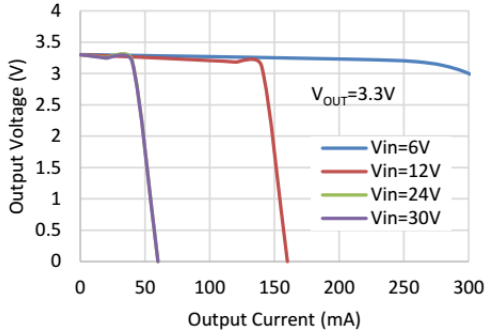
### Typical Performance Characteristics

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

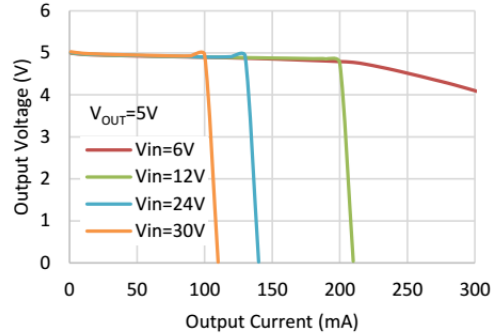




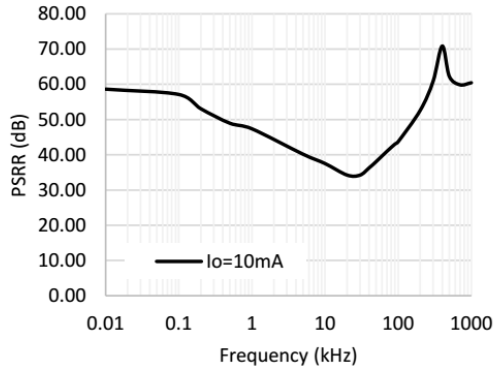
Output Voltage vs. Output Current



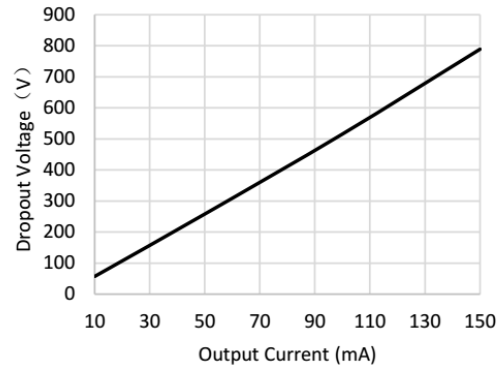
Output Voltage vs. Output Current



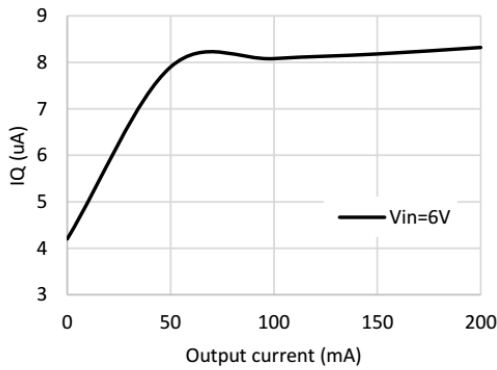
PSRR vs. Frequency



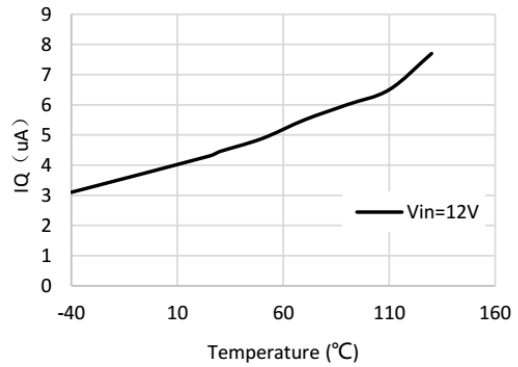
Dropout Voltage vs. Output Current



IQ vs. Output current

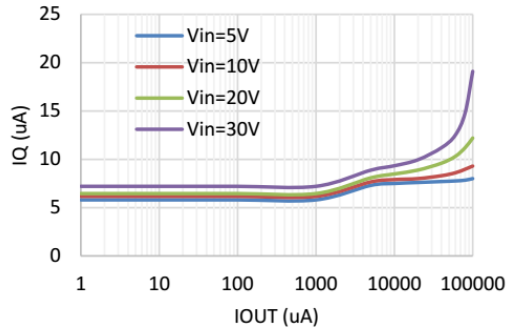


IQ vs. Temperature





### IQ vs. IOU



### Power ON/OFF

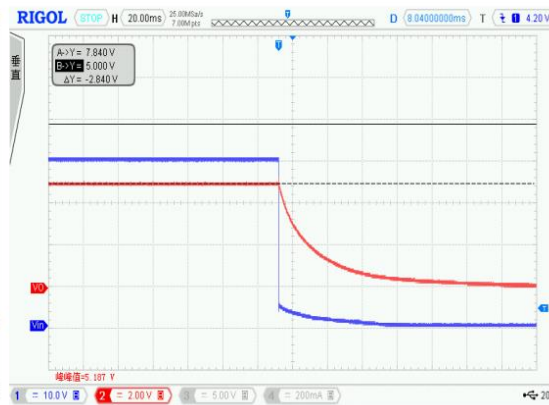
CH1:  $V_{IN}$

CH2:  $V_{OUT}$

$V_{IN}=40V$

$I_{OUT}=1mA$

$V_{OUT}=5V$



### Line Transient

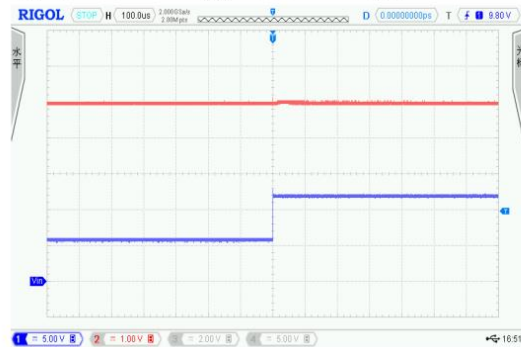
CH1:  $V_{IN}$

CH2:  $V_{OUT}$

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

$I_{OUT}=1mA$

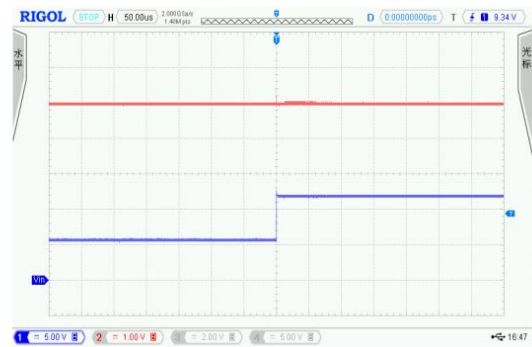
$V_{OUT}=5V$



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

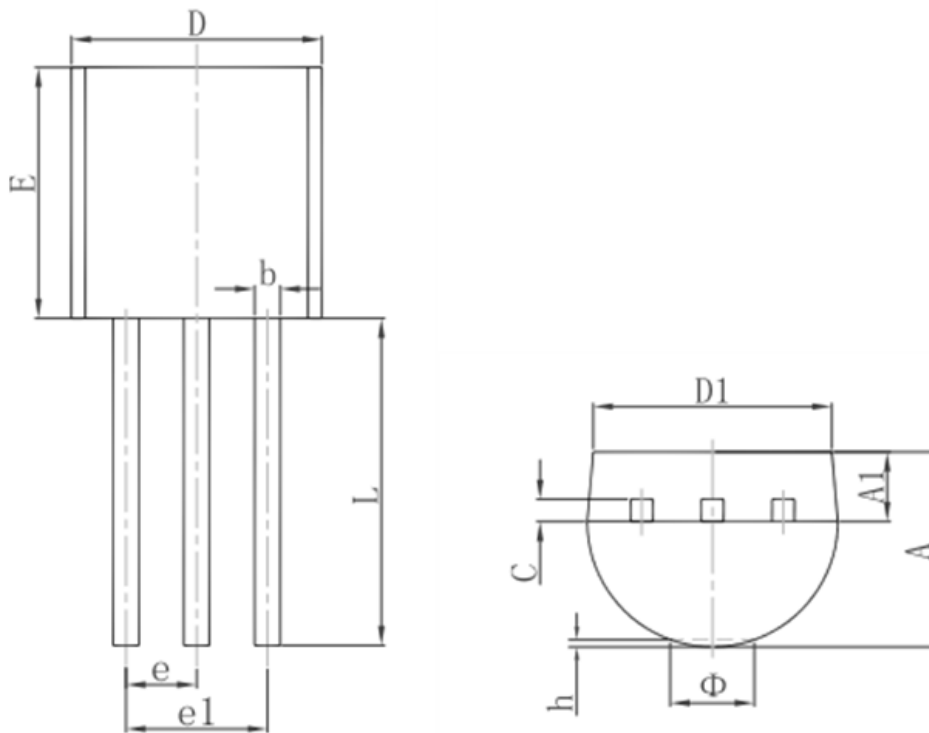
$I_{OUT}=10mA$

$V_{OUT}=5V$





### Package Information 3-pin TO92 Outline Dimensions

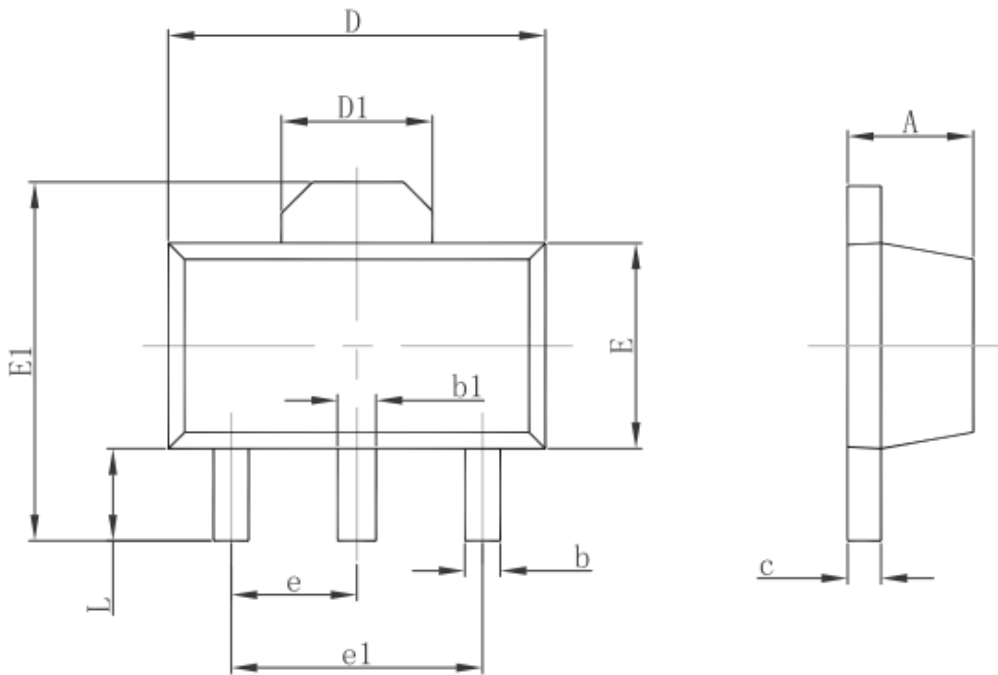


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.300	4.700	0.169	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270 TYP.		0.050 TYP.	
e1	2.440	2.640	0.096	0.104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





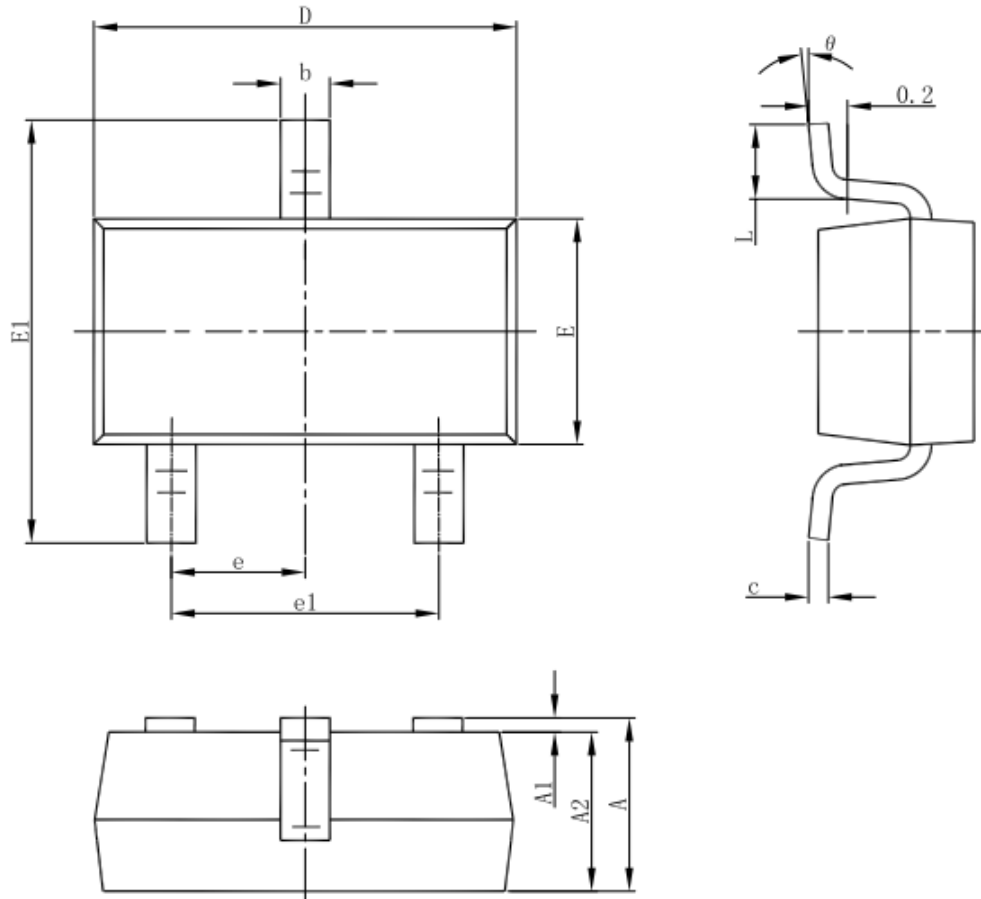
### 3-pin SOT89 Outline Dimensions



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



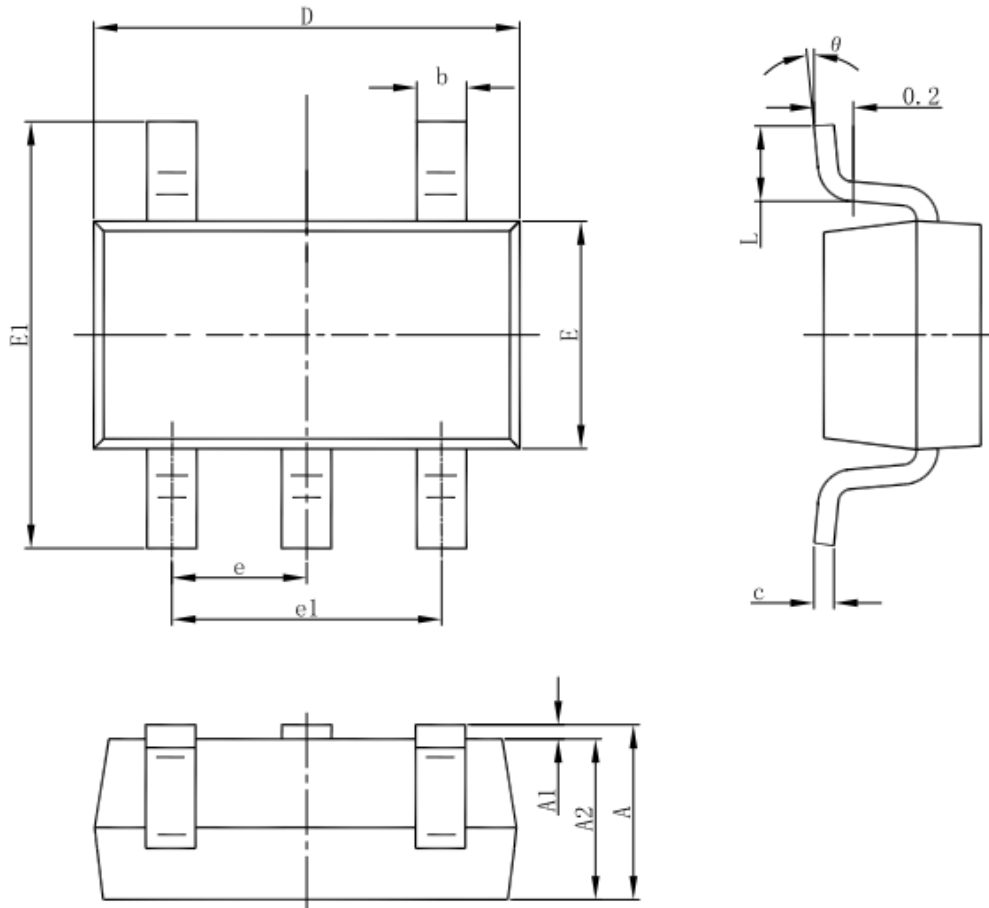
### 3-pin SOT23-3 Outline Dimensions



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°



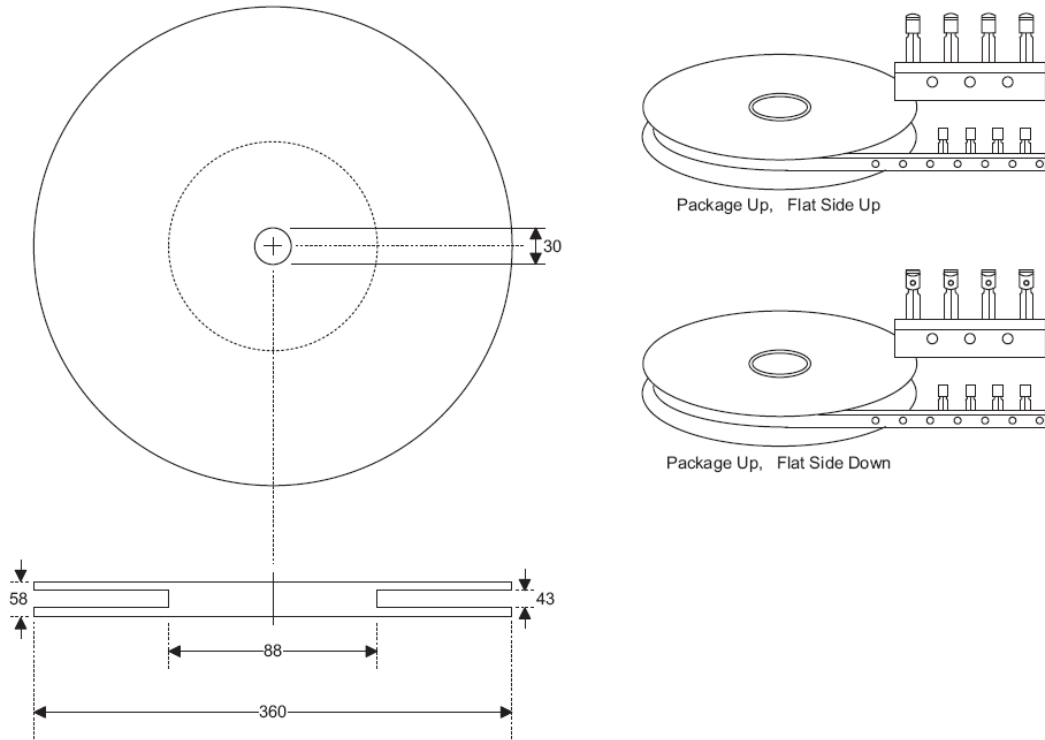
### SOT23-5 Outline Dimensions



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°

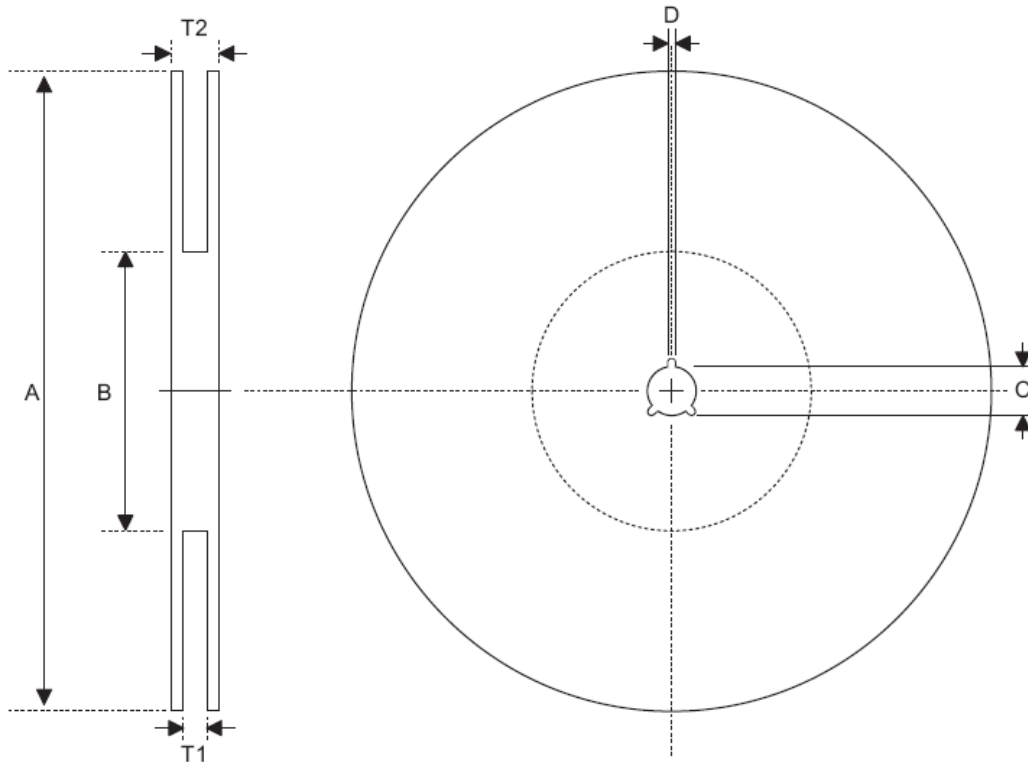


### Product Tape and Reel Specifications 3-pin T092 Reel Dimensions (Unit: mm)





### Reel Dimensions



#### SOT89

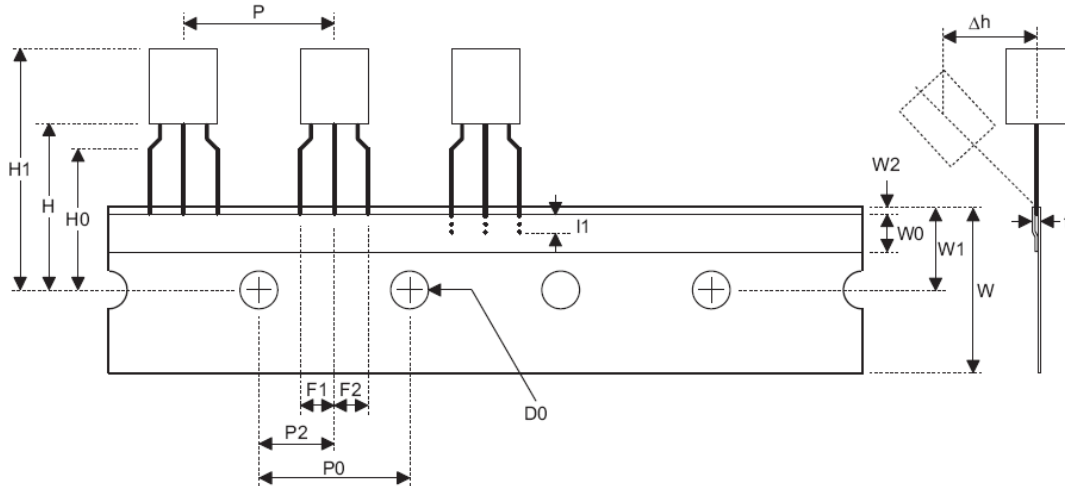
Symbol	Description	Dimensions in mm
A	Reel Outer Diameter	180.0±1.0
B	Reel Inner Diameter	62.0±1.5
C	Spindle Hole Diameter	12.75 <sup>+0.15/-0.00</sup>
D	Key Slit Width	1.90±0.15
T1	Space Between Flange	12.4 <sup>+0.2/-0.00</sup>
T2	Reel Thickness	17.0 <sup>+0.0/-0.4</sup>

#### SOT23-5

Symbol	Description	Dimensions in mm
A	Reel Outer Diameter	178.0±1.0
B	Reel Inner Diameter	62.0±1.0
C	Spindle Hole Diameter	13.0±0.2
D	Key Slit Width	2.50±0.25
T1	Space Between Flange	8.4 <sup>+1.5/-0.0</sup>
T2	Reel Thickness	11.4 <sup>+1.5/-0.0</sup>



### Carrier Tape Dimensions



TO92

Symbol	Description	Dimensions in mm
I1	Taped Lead Length	(2.5)
P	Component Pitch	12.7±1.0
P <sub>0</sub>	Perforation Pitch	12.7±0.3
P <sub>2</sub>	Component to Perforation (Length Direction)	6.35±0.40
F <sub>1</sub>	Lead Spread	2.5 <sup>+0.4/-0.1</sup>
F <sub>2</sub>	Lead Spread	2.5 <sup>+0.4/-0.1</sup>
Δh	Component Alignment	0.0±0.1
W	Carrier Tape Width	18.0 <sup>+1.0/-0.5</sup>
W <sub>0</sub>	Hold-down Tape Width	6.0±0.5
W <sub>1</sub>	Perforation Position	9.0±0.5
W <sub>2</sub>	Hold-down Tape Position	(0.5)
H <sub>0</sub>	Lead Clinch Height	16.0±0.5
H <sub>1</sub>	Component Height	Less than 24.7
D <sub>0</sub>	Perforation Diameter	4.0±0.2
t	Taped Lead Thickness	0.7±0.2
H	Component Base Height	19.0±0.5

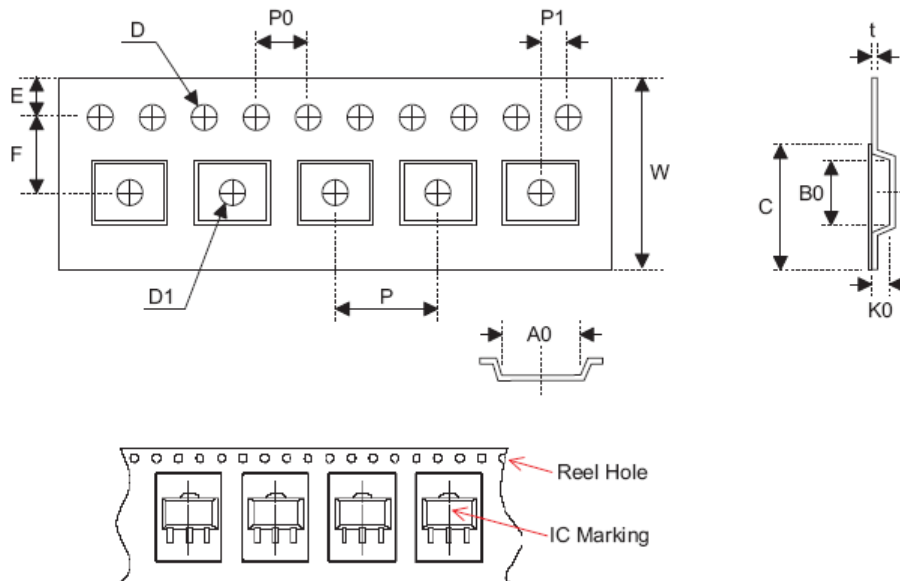
Note: Thickness less than 0.38\_0.05mm~0.5mm

P<sub>0</sub> Accumulated pitch tolerance: \_1mm/20pitches.

( ) Bracketed figures are for consultation only



### Carrier Tape Dimensions



#### SOT89

Symbol	Description	Dimensions in mm
W	Carrier Tape Width	12.0 <sup>+0.3/-0.1</sup>
P	Cavity Pitch	8.0±0.1
E	Perforation Position	1.75±0.10
F	Cavity to Perforation (Width Direction)	5.50±0.05
D	Perforation Diameter	1.5 <sup>+0.1/-0.0</sup>
D1	Cavity Hole Diameter	1.5 <sup>+0.1/-0.0</sup>
P0	Perforation Pitch	4.0±0.1
P1	Cavity to Perforation (Length Direction)	2.0±0.1
A0	Cavity Length	4.8±0.1
B0	Cavity Width	4.5±0.1
K0	Cavity Depth	1.8±0.1
t	Carrier Tape Thickness	0.300±0.013
C	Cover Tape Width	9.3±0.1

#### SOT23-5

Symbol	Description	Dimensions in mm
W	Carrier Tape Width	8.0±0.3
P	Cavity Pitch	4.0±0.1
E	Perforation Position	1.75±0.10
F	Cavity to Perforation (Width Direction)	3.50±0.05
D	Perforation Diameter	1.5 <sup>+0.1/-0.0</sup>
D1	Cavity Hole Diameter	1.5 <sup>+0.1/-0.0</sup>
P0	Perforation Pitch	4.0±0.1
P1	Cavity to Perforation (Length Direction)	2.00±0.05
A0	Cavity Length	3.15±0.10
B0	Cavity Width	3.2±0.1
K0	Cavity Depth	1.4±0.1
t	Carrier Tape Thickness	0.20±0.03
C	Cover Tape Width	5.3±0.1



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