TX75XXH series
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 ±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 TX75XXH 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
TX7518Hxx	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)
TX7525Hxx	2.5V		
TX7527Hxx	2.7V		
TX7530Hxx	3.0V		
TX7533Hxx	3.3V		
TX7536Hxx	3.6V		
TX7540Hxx	4.0V		
TX7544Hxx	4.4V		
TX7550Hxx	5.0V		

Note:"XX" stands for output voltages.

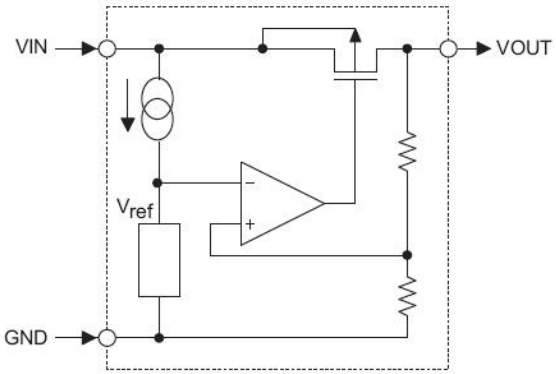
TO92 & SOT89 packages will add a "#" mark at the end of the marking.

Order Information

TX75①②③④⑤

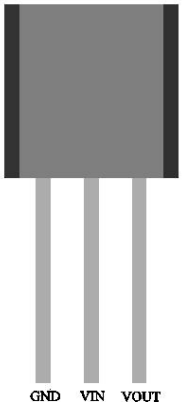
Designator	Symbol	Description
① ②	Integer	Output Voltage(1.8~5.0V)
③	H	Standard
④	T	Package:TO-92
	P	Package:SOT89
	M	Package:SOT23-3
	M5	Package:SOT23-5
	M5B	Package:SOT23-5B
⑤	R	RoHS / Pb Free
	G	Halogen Free

Block Diagram



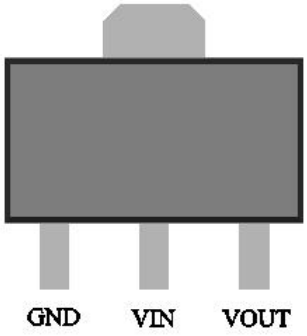
Pin Assignment

TO92 (Front view)



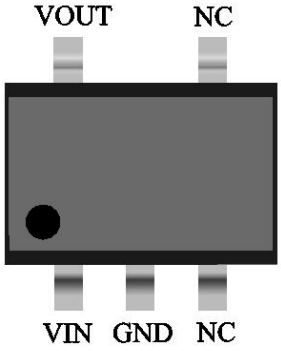
TX75XXHTG

SOT89 (Top view)



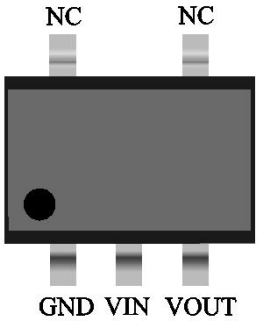
TX75XXHPG

SOT23-5 (Top view)



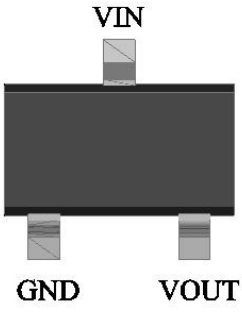
TX75XXHM5G

SOT23-5B (Top view)



TX75XXHM5BG

SOT23-3 (Top view)



TX75XXHMG

Absolute Maximum Ratings

Supply Voltage .....-0.3V to 40V Storage Temperature .....-50℃ to 125℃

Operating Temperature .....-40℃ to 85℃

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	℃/W
		SOT89	200	℃/W
		SOT23-3	500	℃/W
		SOT23-5	500	℃/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 Ta= 25℃

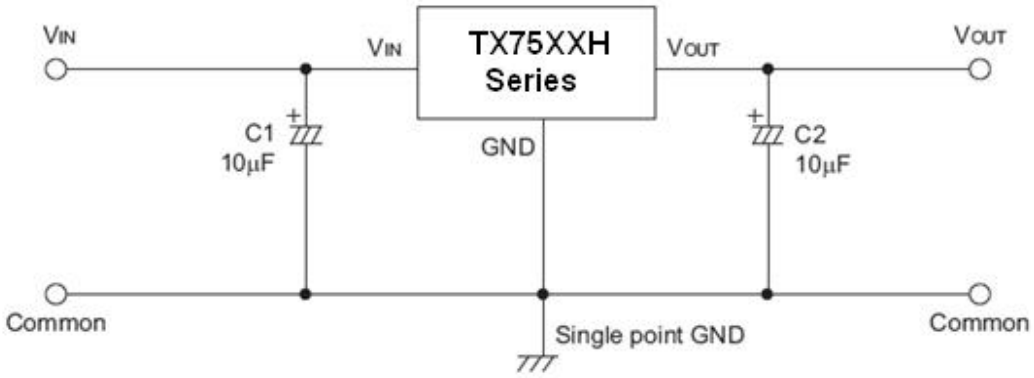
Electrical Characteristics

The following specifications apply for VIN = 12V, TA=25℃, C_{IN}=C_{OUT}=10μF, unless specified otherwise.

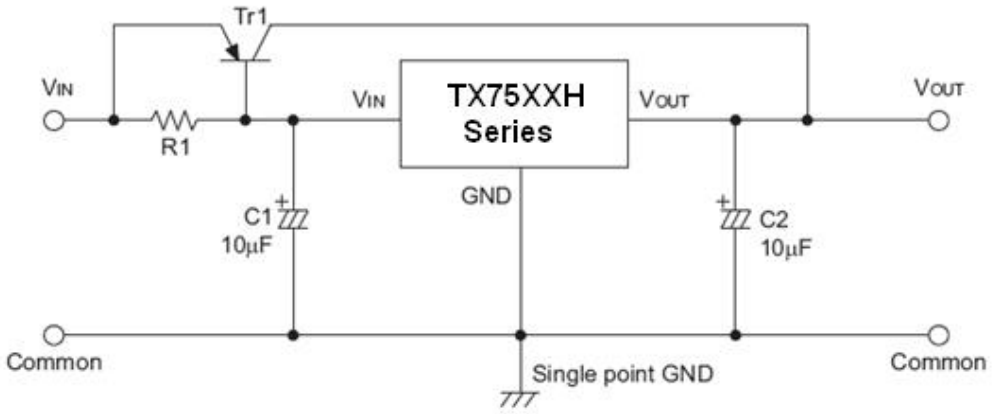
SYMBOL	ITEMS	CONDITIONS		MIN	TYP	MAX	UNIT
V_{IN}	Input Range	I_{OUT} = 10mA		4.75		40	V
V_{OUT}	Output Range	I_{OUT} = 10mA		V_{OUT}x0.98	V_{OUT}	V_{OUT}x1.02	V
ΔV_{OUT}	Output Voltage	V_{IN} = 12V, I_{OUT} = 10mA		4.9	5	5.1	V
				3.234	3.3	3.366	
				2.94	3.0	3.06	
I_Q	Quiescent Current	V_{IN} = 7V, 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=1Ω			190		mA
V_{DROP}	Dropout Voltage	I_{OUT} = 10mA			60	90	mV
		I_{OUT} = 100mA			600	900	
ΔV_{LINE}	Line Regulation	V_{IN} =7 ~ 24V, V_{OUT} = 5V, I_{OUT} = 1mA			0.02	0.03	%/V
		V_{IN} = 7 ~ 45V, V_{OUT} = 5V, I_{OUT} = 1mA			0.08	0.1	
ΔV_{LOAD}	Load Regulation	V_{IN} = 7V , I_{OUT} = 1 ~ 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 μF, I_{OUT}=10mA			±100		μV_{RMS}
T_{SD}	Thermal Shutdown Protection	V_{IN} = 12V, I_{OUT} = 1mA			165		℃
$\Delta V_O/\Delta T$	Temperature Coefficient				±0.5		mV/℃

Application Circuits

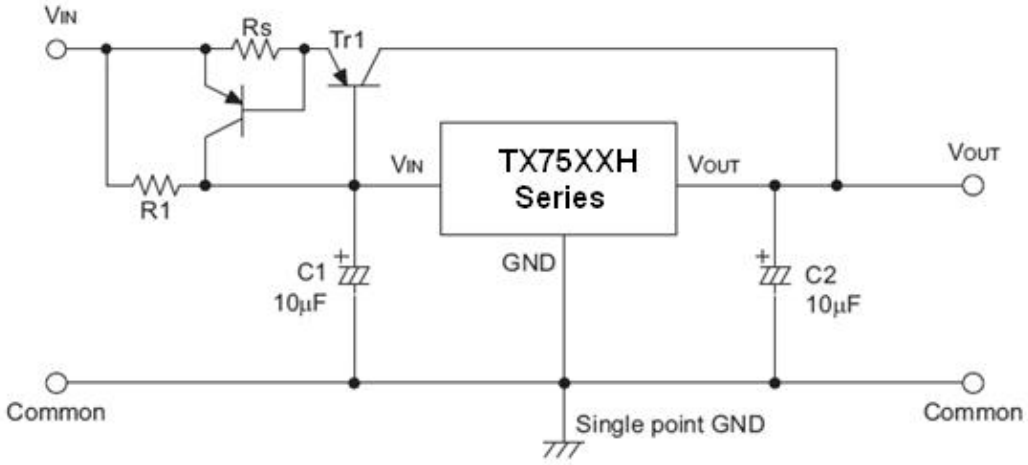
Basic Circuits



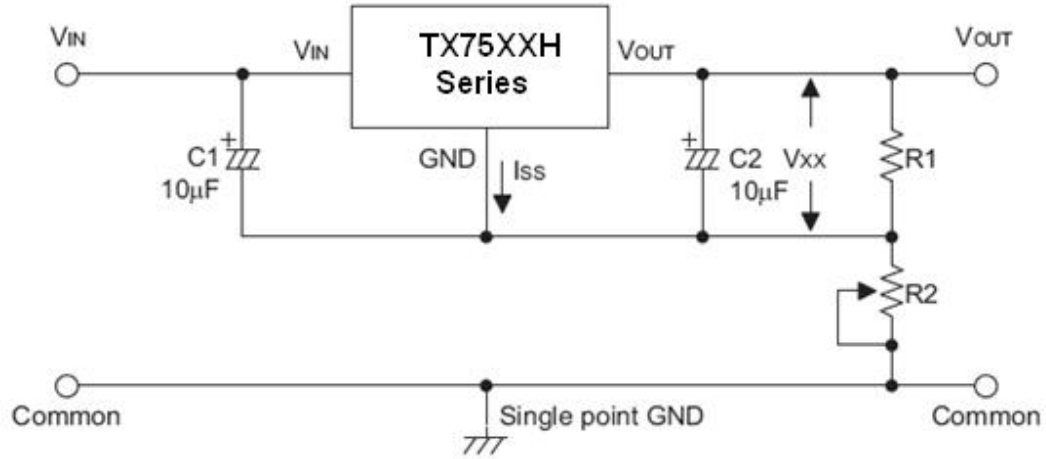
High Output Current Positive Voltage Regulator



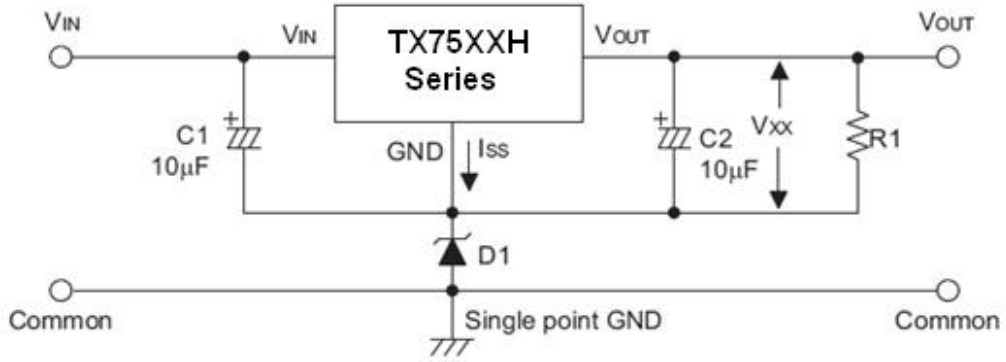
Short-Circuit Protection by Tr1



Circuit for Increasing Output Voltage

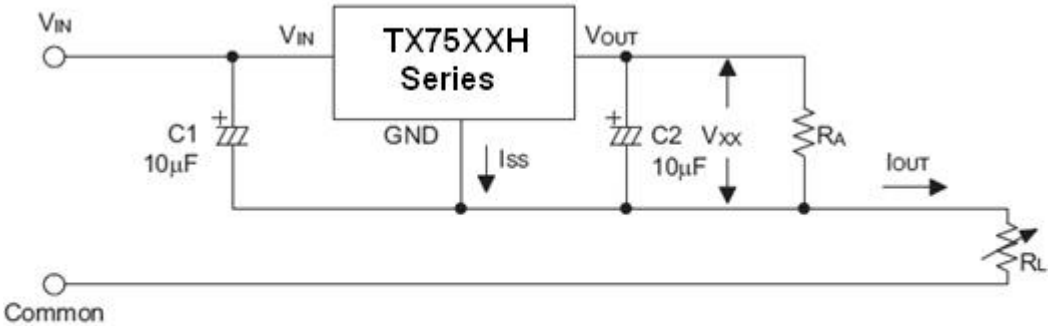


Circuit for Increasing Output Voltage



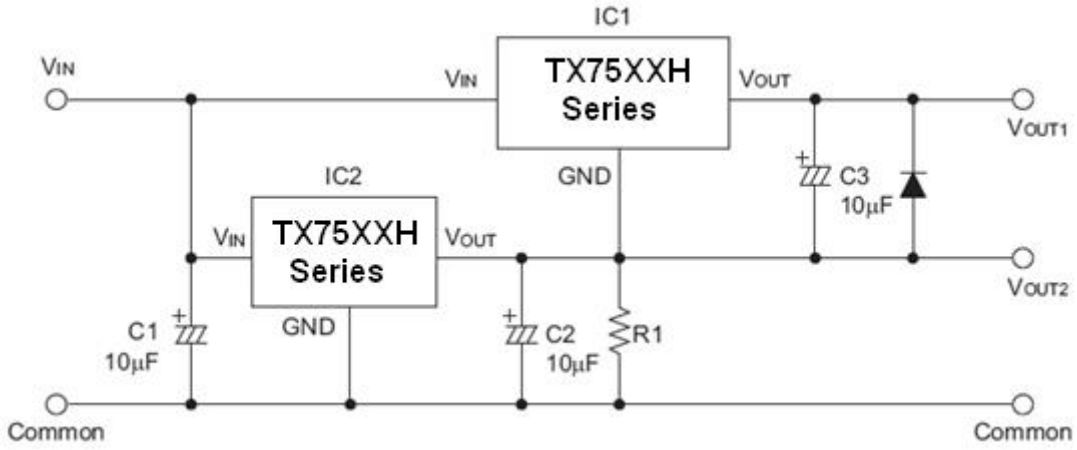
$V_{OUT}=V_{XX}+V_{D1}$

Constant Current Regulator



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

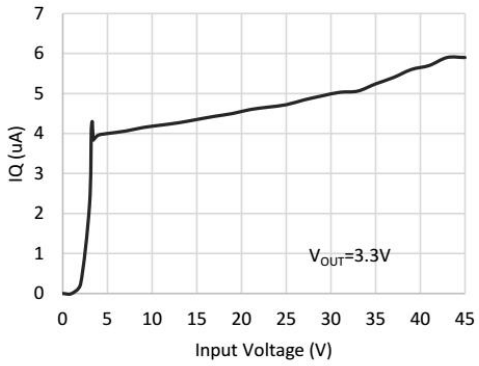
Dual Supply


IC1
VIN
VIN
TX75XXH
Series
VOUT
VOUT1
GND
C3
10μF
IC2
VIN
TX75XXH
Series
VOUT
VOUT2
C1
10μF
GND
C2
10μF
R1
Common
Common

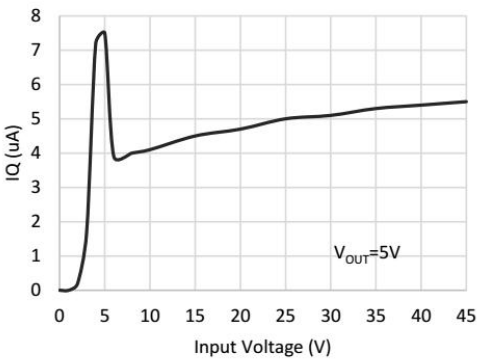
Typical Performance Characteristics

C_{IN} = 10μF, C_{OUT} = 10μF, T_{OPT} = 25℃, unless specified otherwise. (Package: SOT89-3L)

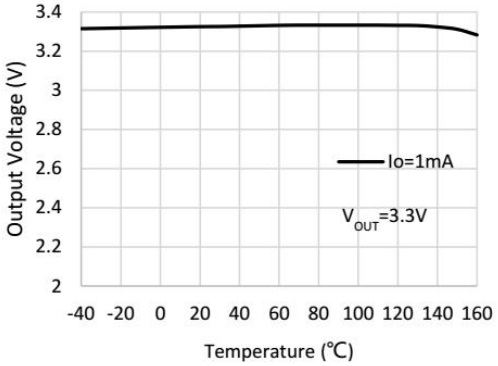
IQ vs. Input Voltage



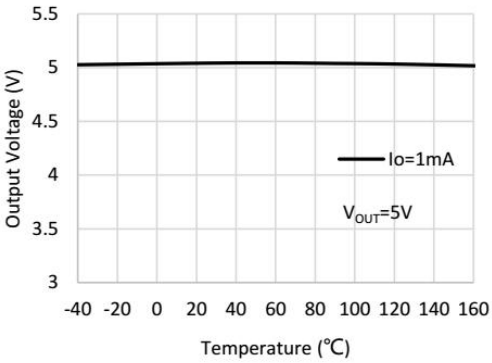
IQ vs. Input Voltage



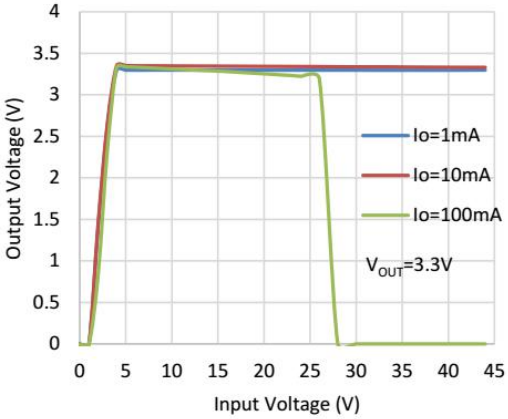
Output Voltage vs. Temperature



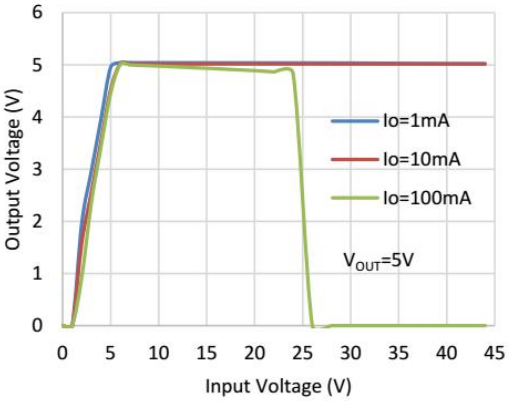
Output Voltage vs. Temperature



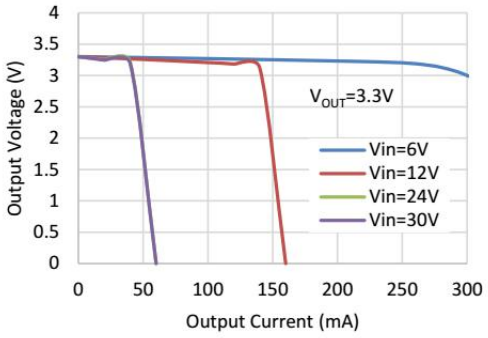
Output Voltage vs. Input Voltage



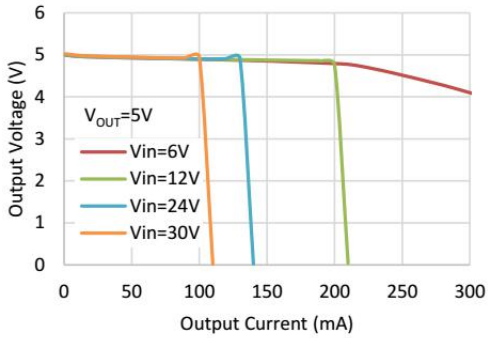
Output Voltage vs. Input Voltage



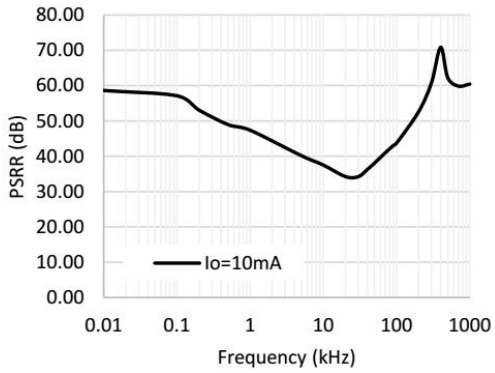
Output Voltage vs. Output Current



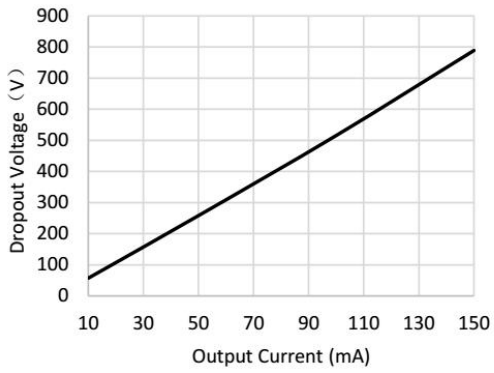
Output Voltage vs. Output Current



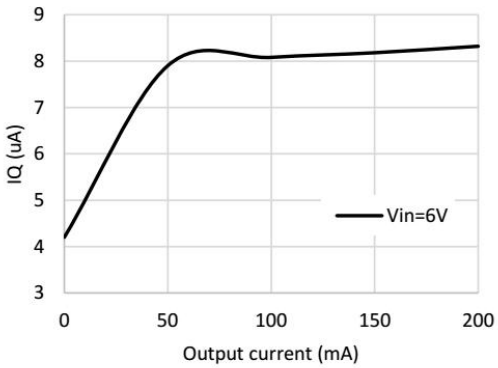
PSRR vs. Frequency



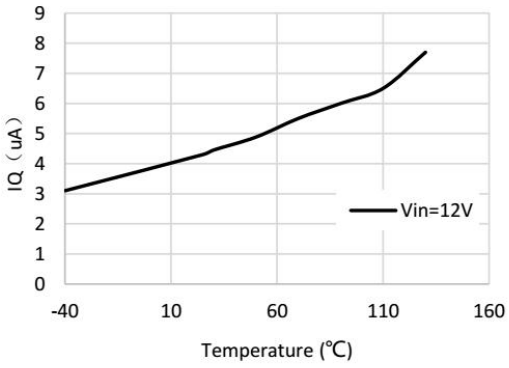
Dropout Voltage vs. Output Current

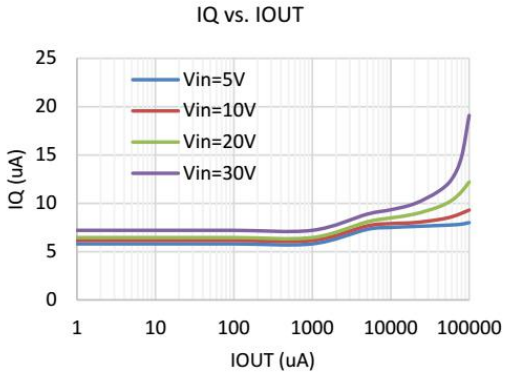


IQ vs. Output current



IQ vs. Temperature

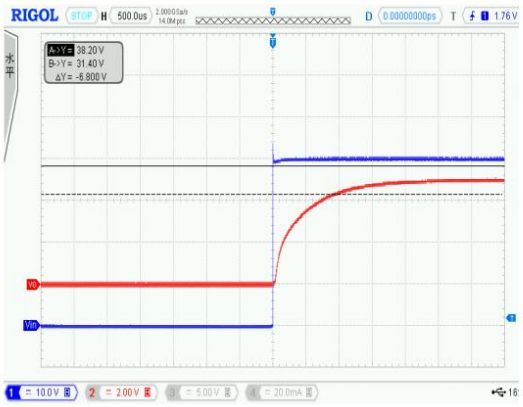


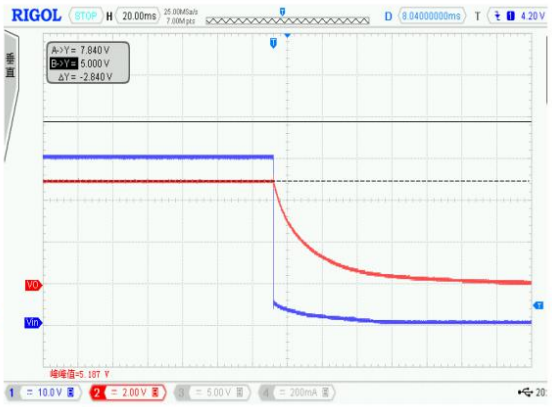


Power ON/OFF

CH1：V_{IN} **CH2：V_{OUT}**

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

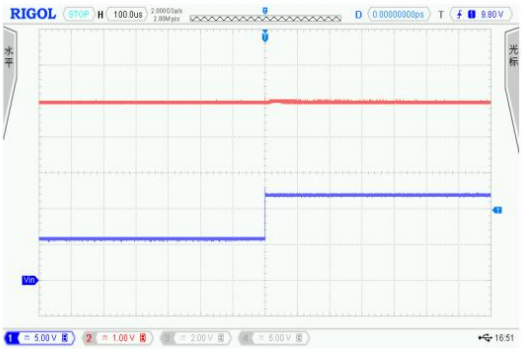




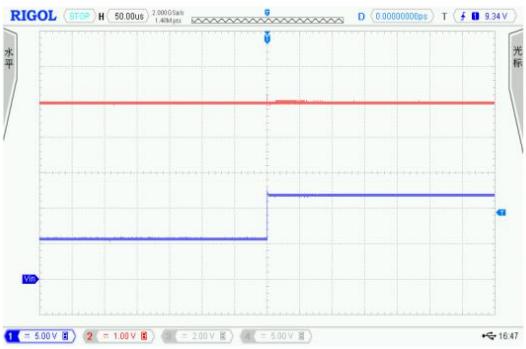
Line Transient

CH1：V_{IN} **CH2：V_{OUT}**

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

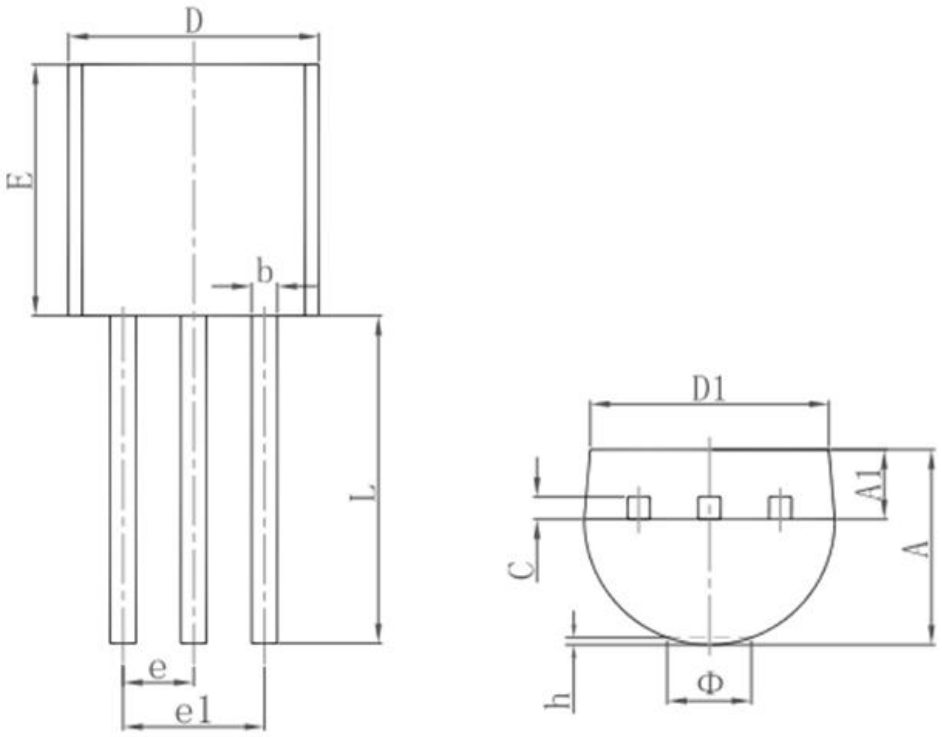


V_{IN}=6V-12V I_{OUT}=10mA V_{OUT}=5V



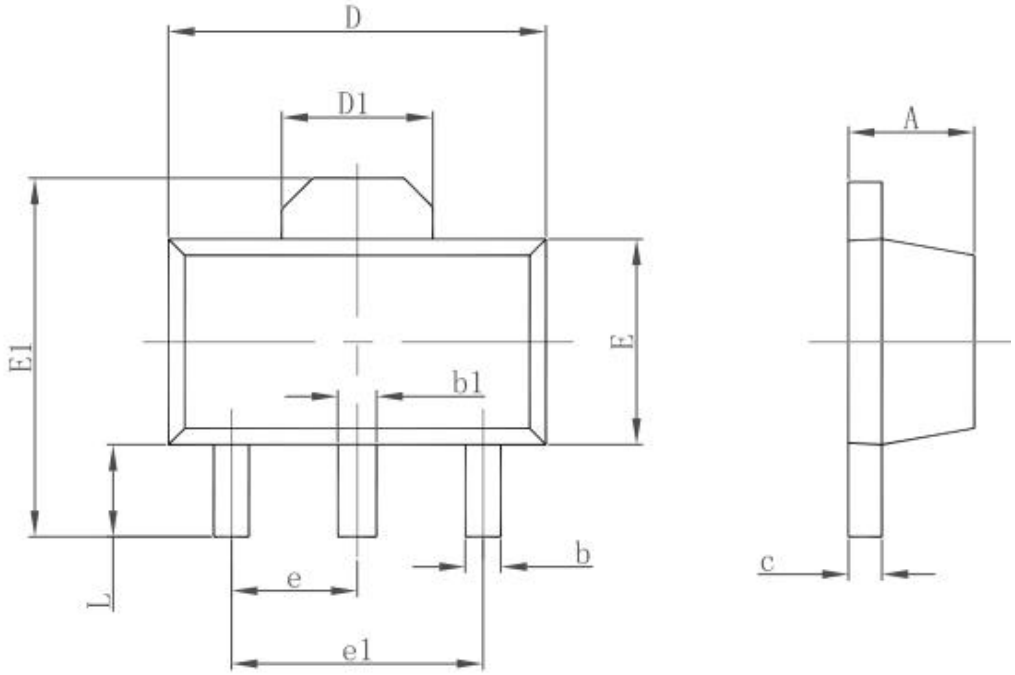
Package Information

3-pin TO92 Outline Dimensions



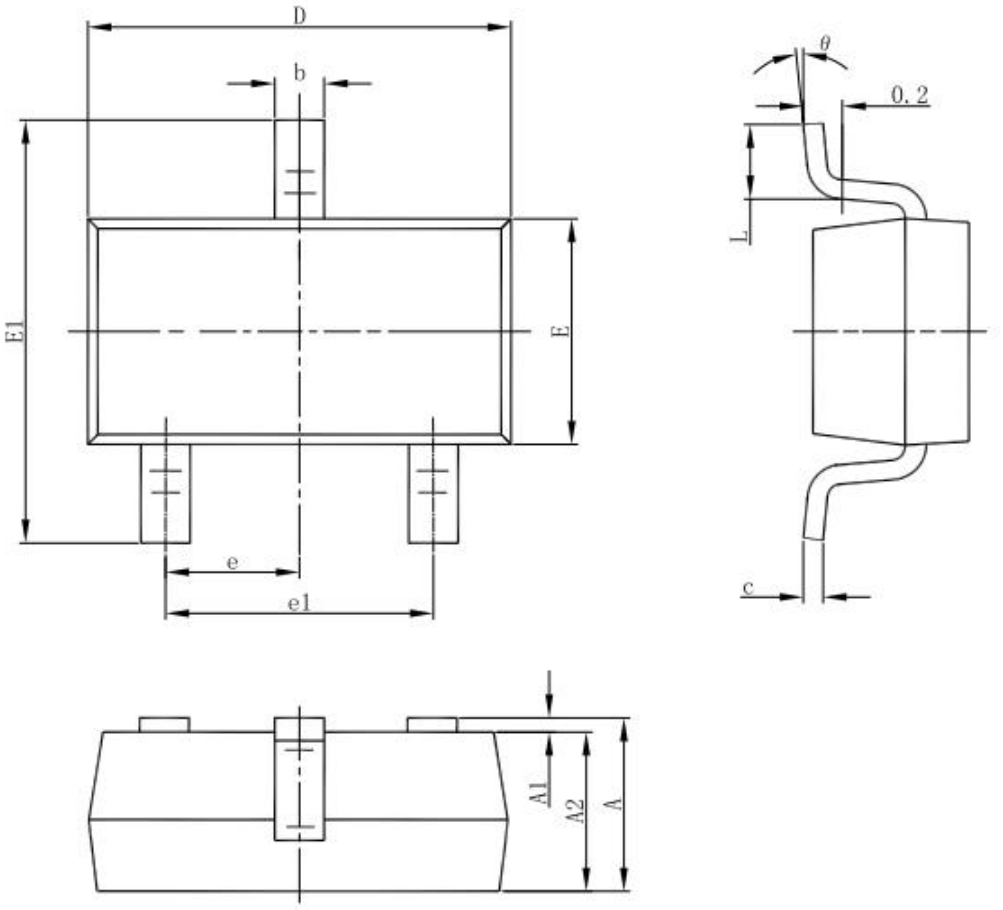
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.300	4.700	0.169	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270 TYP.		0.050 TYP.	
e1	2.440	2.640	0.096	0.104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



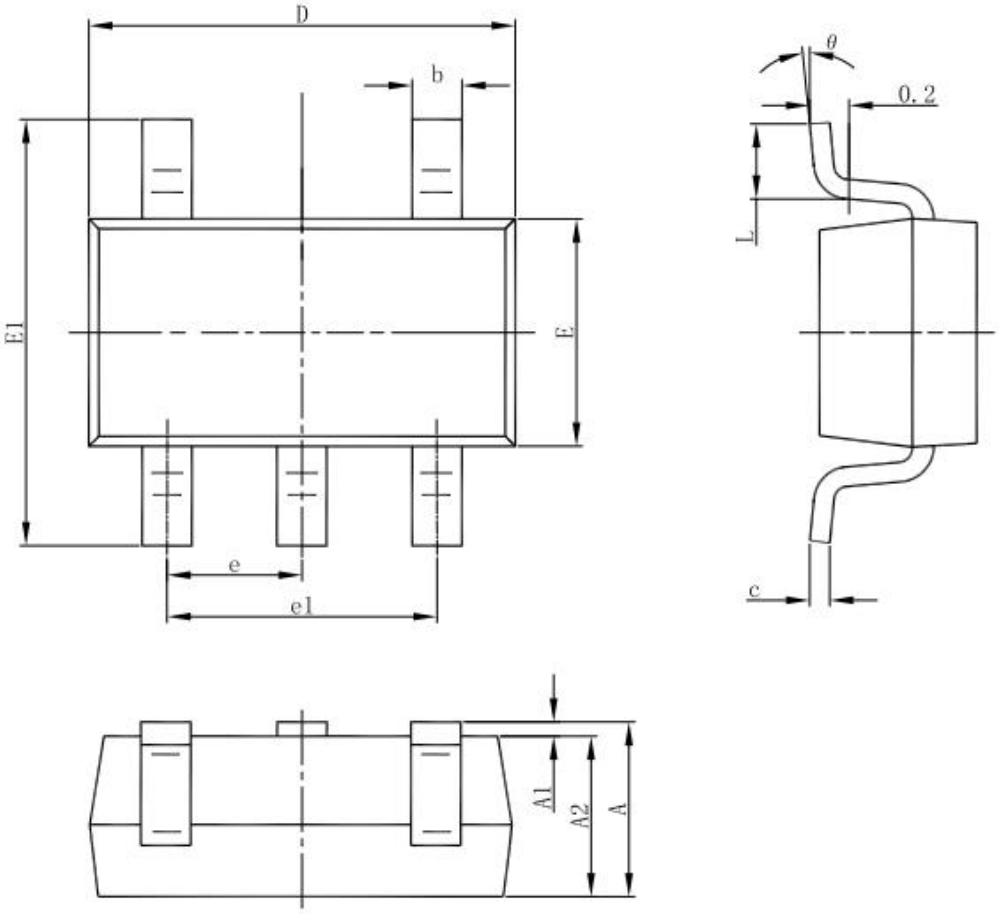
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.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

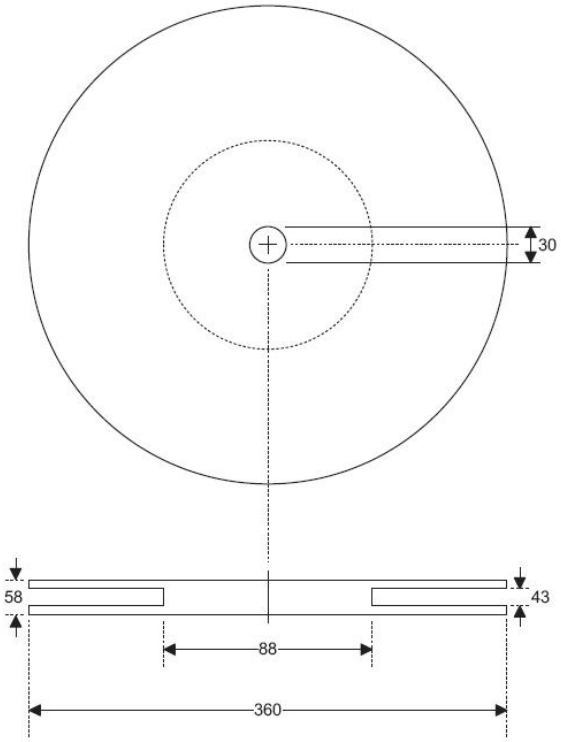
SOT23-5 Outline Dimensions

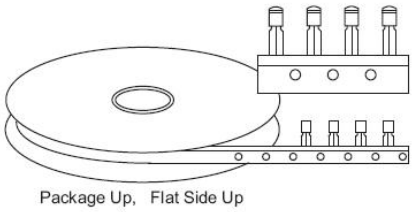


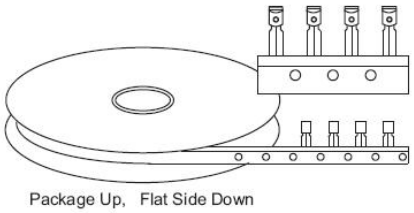
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

Product Tape and Reel Specifications

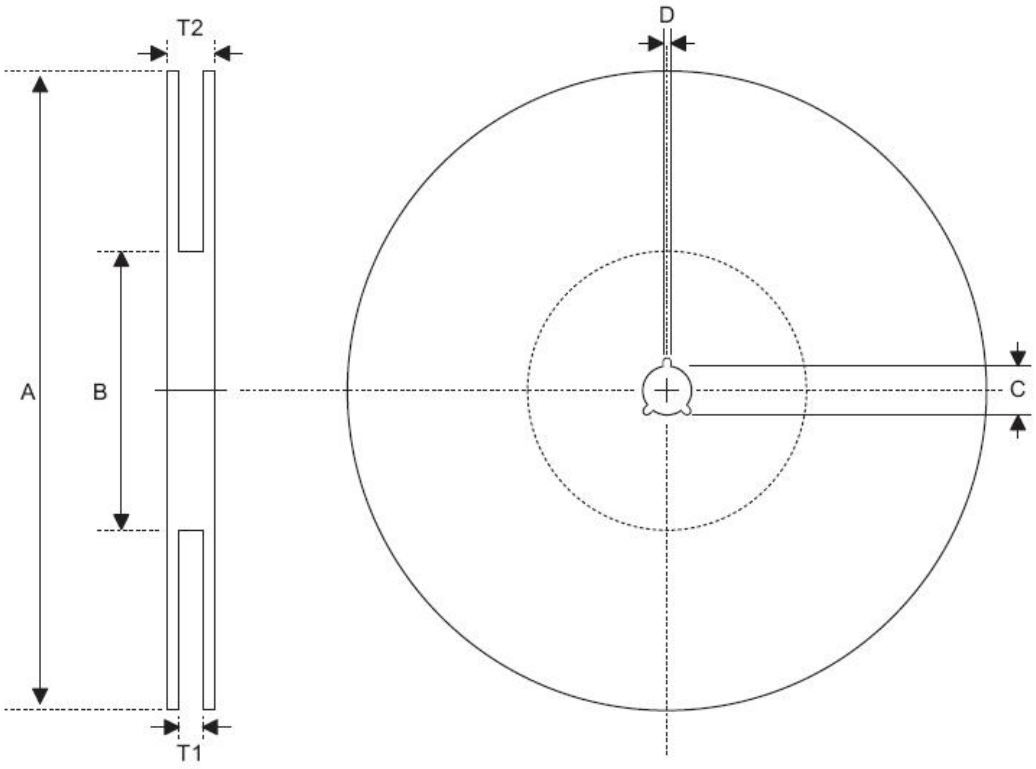
3-pin TO92 Reel Dimensions (Unit: mm)







Reel Dimensions



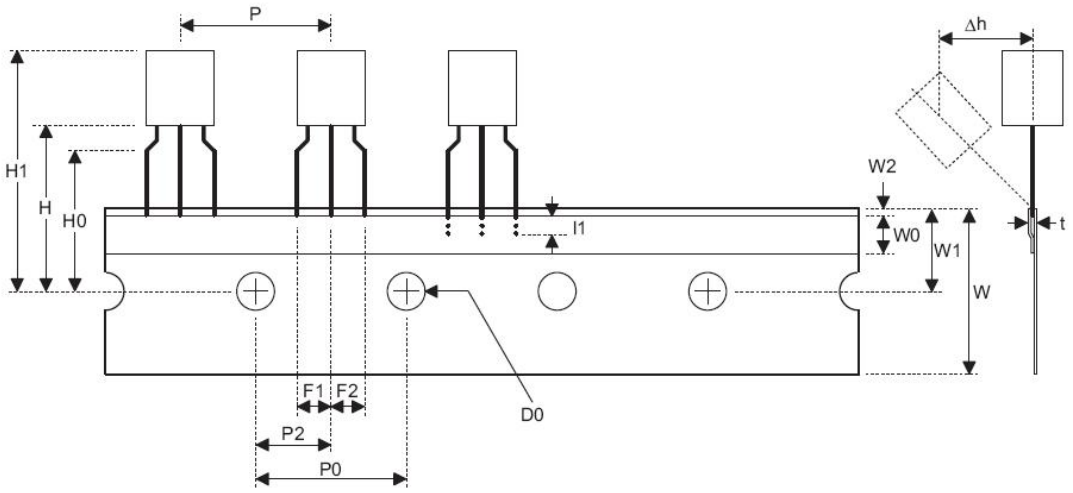
SOT89

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	$12.75^{+0.15/-0.00}$
D	Key Slit Width	1.90±0.15
T1	Space Between Flange	$12.4^{+0.2/-0.00}$
T2	Reel Thickness	$17.0^{+0.0/-0.4}$

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	$8.4^{+1.5/-0.0}$
T2	Reel Thickness	$11.4^{+1.5/-0.0}$

Carrier Tape Dimensions



TO92

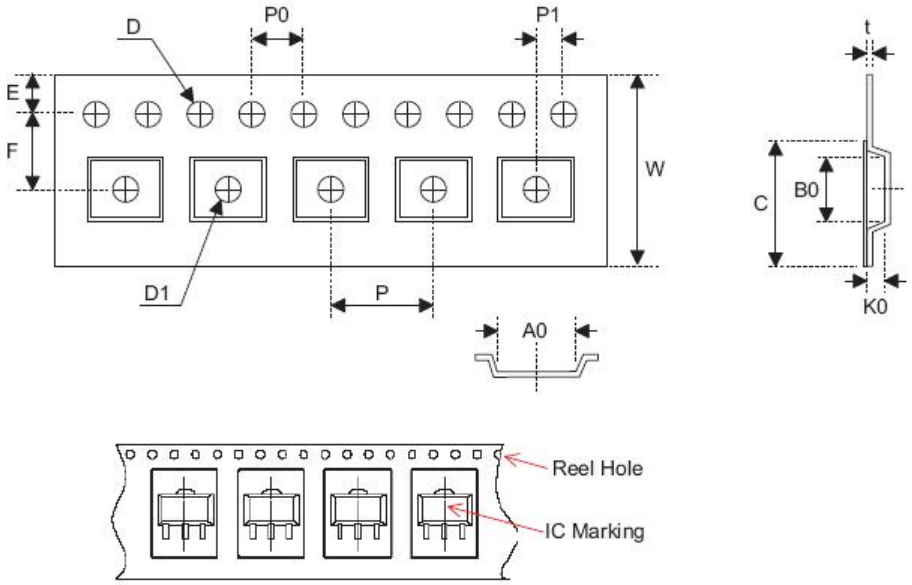
Symbol	Description	Dimensions in mm
I1	Taped Lead Length	(2.5)
P	Component Pitch	12.7±1.0
P_0	Perforation Pitch	12.7±0.3
P_2	Component to Perforation (Length Direction)	6.35±0.40
F_1	Lead Spread	$2.5^{+0.4/-0.1}$
F_2	Lead Spread	$2.5^{+0.4/-0.1}$
Δh	Component Alignment	0.0±0.1
W	Carrier Tape Width	$18.0^{+1.0/-0.5}$
W_0	Hold-down Tape Width	6.0±0.5
W_1	Perforation Position	9.0±0.5
W_2	Hold-down Tape Position	(0.5)
H_0	Lead Clinch Height	16.0±0.5
H_1	Component Height	Less than 24.7
D_0	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

P0 Accumulated pitch tolerance: _1mm/20pitches.

( ) Bracketed figures are for consultation only

Carrier Tape Dimensions



SOT89

Symbol	Description	Dimensions in mm
W	Carrier Tape Width	$12.0^{+0.3/-0.1}$
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	$1.5^{+0.1/-0.0}$
D1	Cavity Hole Diameter	$1.5^{+0.1/-0.0}$
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	$1.5^{+0.1/-0.0}$
D1	Cavity Hole Diameter	$1.5^{+0.1/-0.0}$
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