



ZHEJIANG UNIÜ-NE Technology CO., LTD

浙江宇力微新能源科技有限公司



## 78S05M Data Sheet

V 1.1

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## Positive voltage regulators

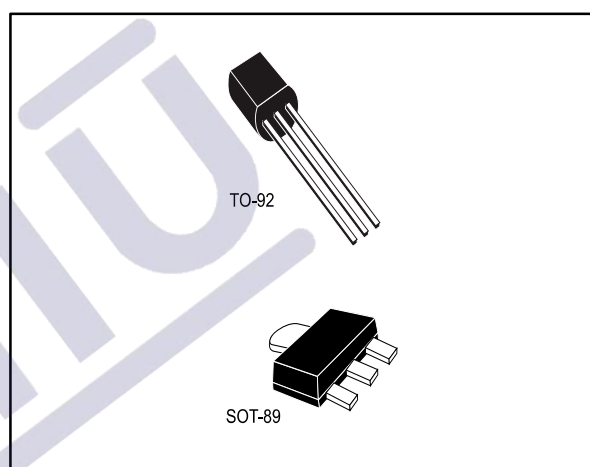
### Description

The 78S05M series of three terminal positive regulators employ internal current limiting and thermal shutdown, making them essentially indestructible. If adequate heat-sink is provided, they can deliver up to 150 mA output current.

They are intended as fixed voltage regulators in a wide range of applications including local or on-card regulation for elimination of noise and distribution problems associated with single-point regulation. In addition, they can be used with power pass elements to make high-current voltage regulators. The 78S05M series used as Zener diode/resistor combination replacement, offers improvement along with lower quiescent current and lower noise.

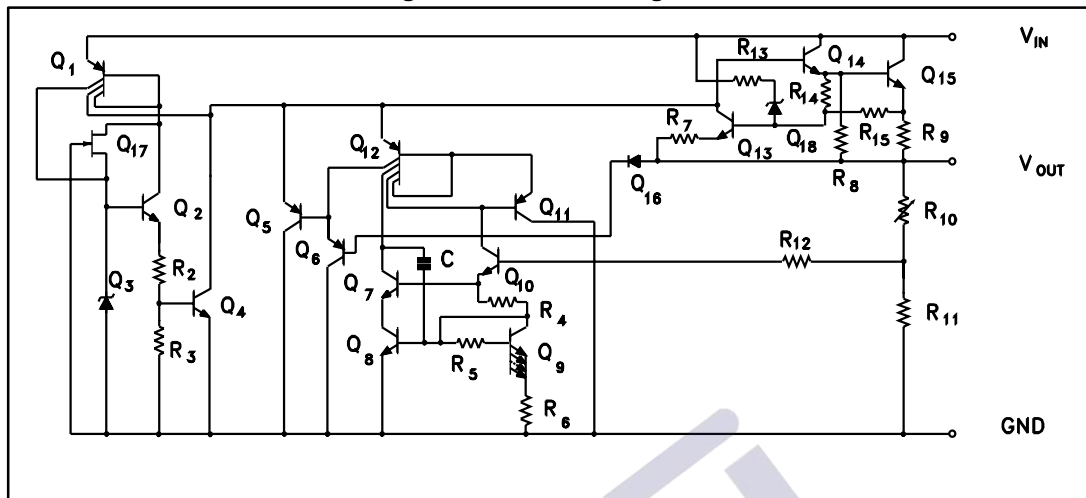
### Features

- Output current up to 150 mA
- Output voltages of 5V thermal overload protection
- Short-circuit protection
- No external components are required
- Available in  $\pm 2\%$



## Diagram

Figure 1: Schematic diagram



## Pin configuration

Figure 2: Pin connection (top view, bottom view for TO-92)

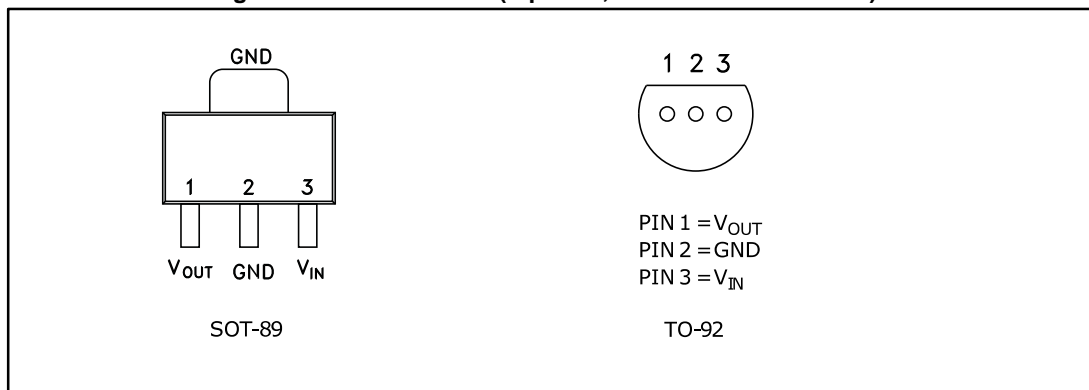
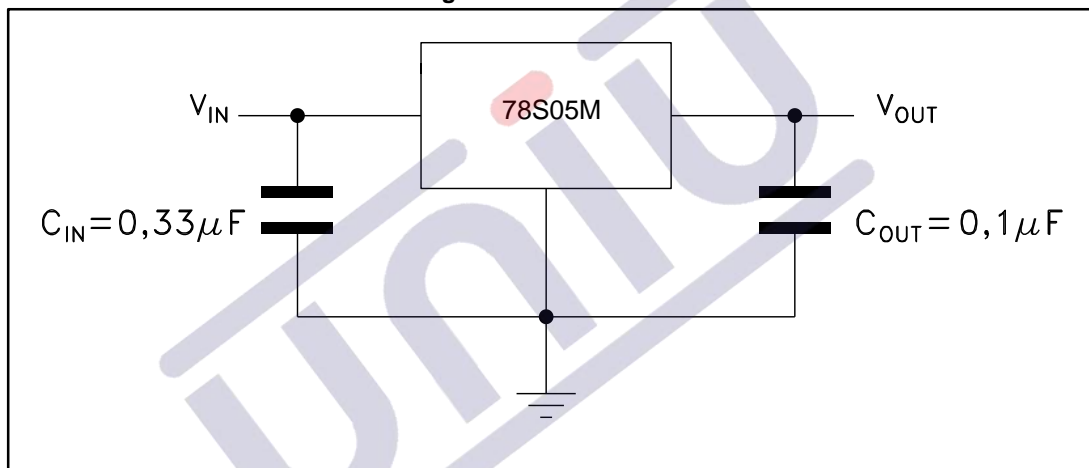


Figure 3: Test circuits



## Maximum ratings

Table 1: Absolute maximum ratings

Symbol	Parameter	Value	Unit
V <sub>I</sub>	DC Input voltage	V <sub>O</sub> = 3.3 to 9 V	30
		V <sub>O</sub> = 12 to 15 V	35
I <sub>O</sub>	Output current	150	mA
T <sub>OP</sub>	Operating junction temperature range	-40 to 125	°C
T <sub>STG</sub>	Storage temperature range	-55 to 150	°C
P <sub>D</sub>	Power dissipation	TO92	500
		SOT89	500

UNI-SEMICONDUCTOR

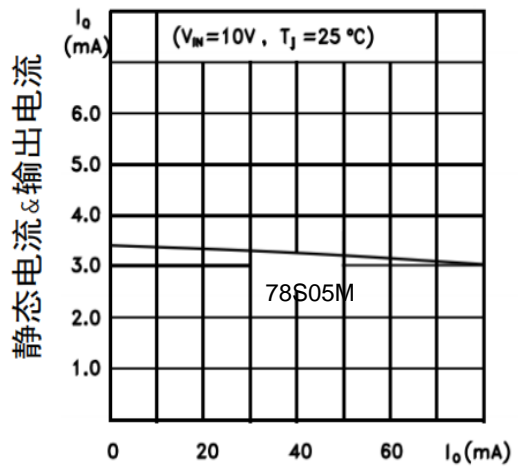
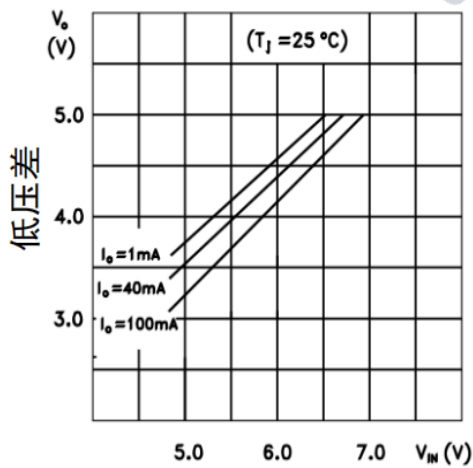
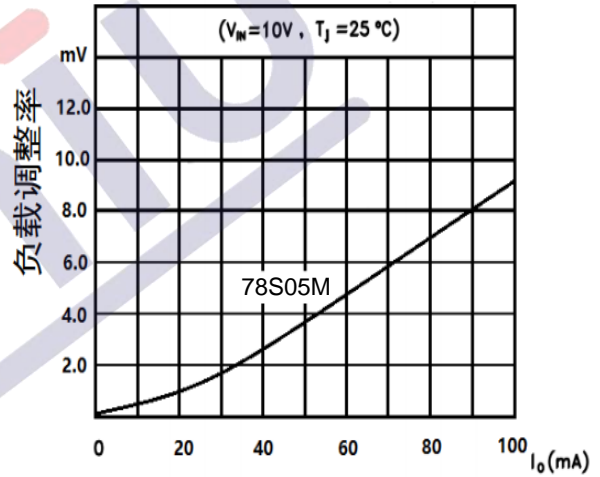
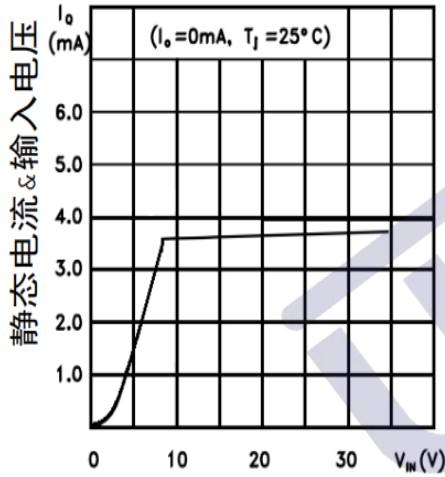
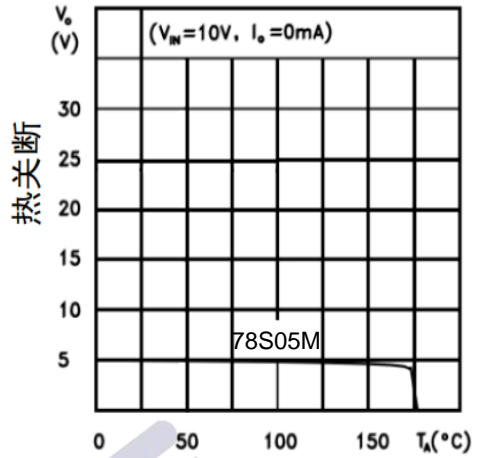
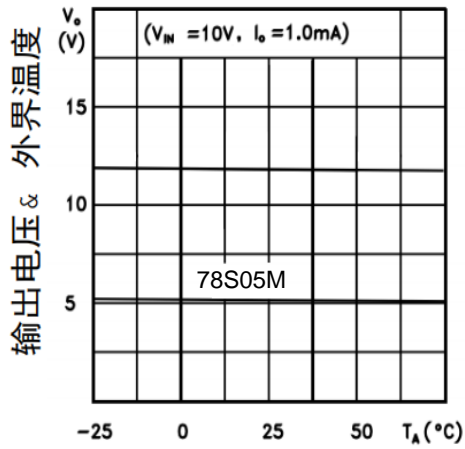
## Electrical characteristics

### ELECTRICAL CHARACTERISTICS

(unless otherwise noted,  $V_i=10V, I_o=40mA, -30^{\circ}C < T_j < 85^{\circ}C, C_1=0.33\mu F, C_o=0.1\mu F$ )

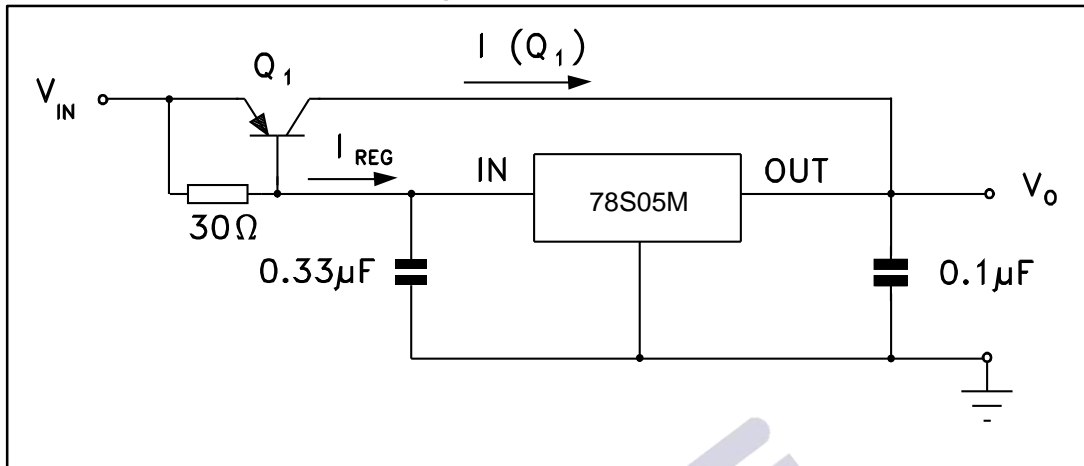
Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Output Voltage	$V_o$	$T_j=25^{\circ}C$ $7V \leq V_i \leq 20V, I_o=5mA \sim 150mA$	4.9		5.1	V
Load Regulation	$\Delta V_o$	$T_j=25^{\circ}C, I_o=5mA \sim 150mA$		25	100	mV
		$T_j=25^{\circ}C, I_o=5mA \sim 100mA$		10	50	
Line Regulation	$\Delta V_o$	$7V \leq V_i \leq 25V, I_o=100mA,$ $T_j=25^{\circ}C$		4	100	mV
		$8V \leq V_i \leq 25V, I_o=100mA,$ $T_j=25^{\circ}C$		2	50	
Quiescent Current	$I_q$	$T_j=25^{\circ}C$		3.2	6	mA
Quiescent Current Charge	$\Delta I_q$	$8V \leq V_i \leq 25V, I_o=100mA$			0.8	mA
		$5mA \leq I_o \leq 150mA$			0.5	
Output noise voltage	$V_N$	$10Hz \leq f \leq 100kHz$		40		$\mu V$
Supply voltage rejection	RR	$10V \leq V_i \leq 20V; f=120Hz; T_j=25^{\circ}C$	41	50		dB
Dropout voltage	$V_d$	$T_j=25^{\circ}C$		1.7		V

Typical performance

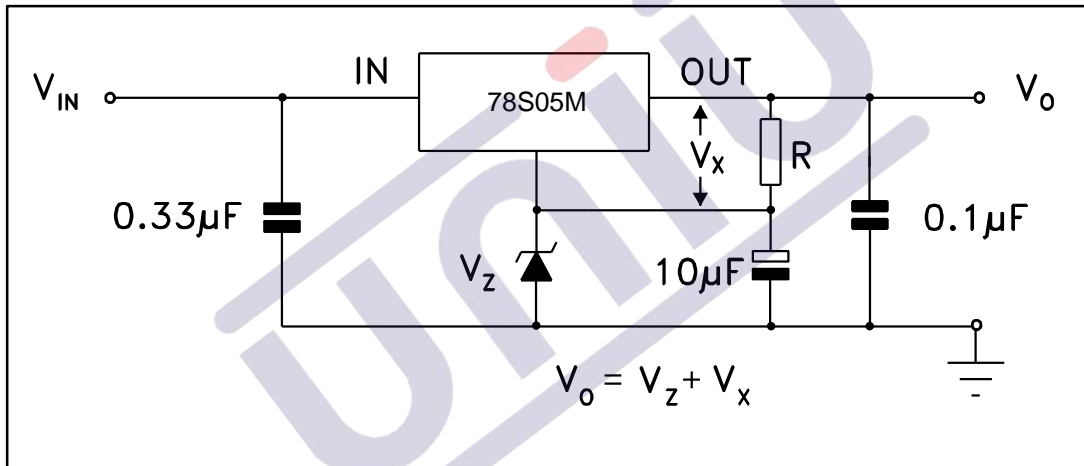


## Typical application

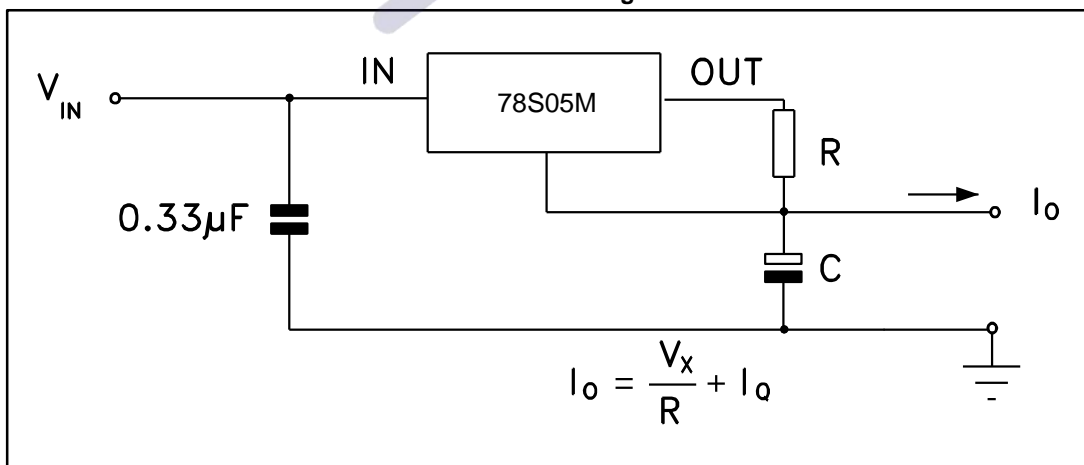
High output current short-circuit protected



Output boost circuit



Current regulator

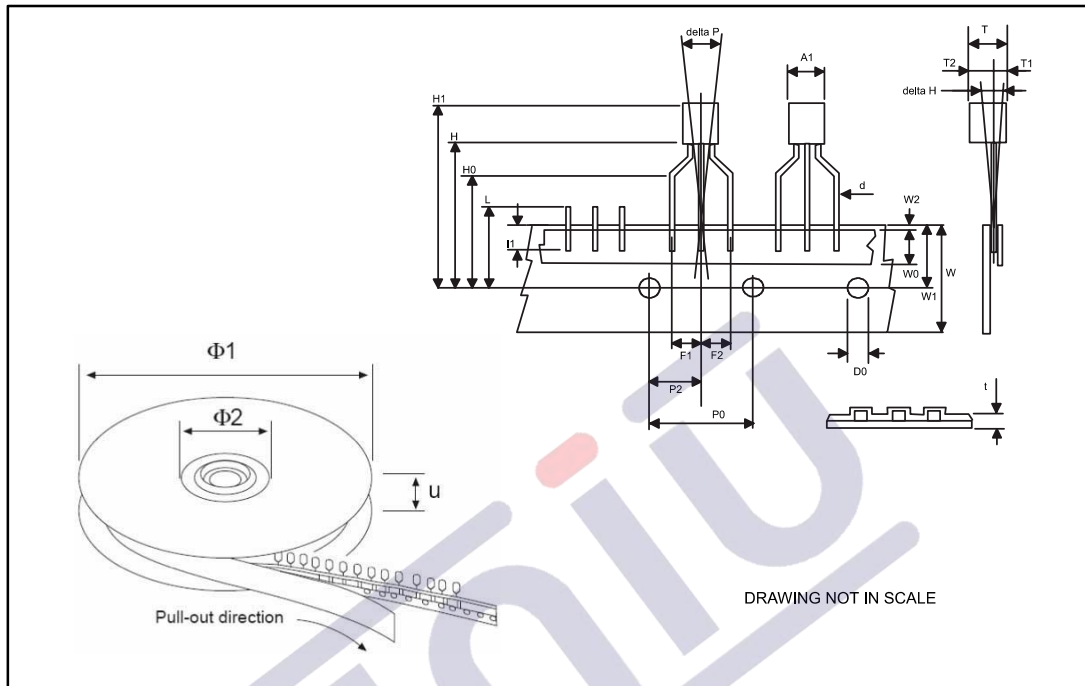




## Package information

### TO-92 packing information

: TO-92 tape and reel outline

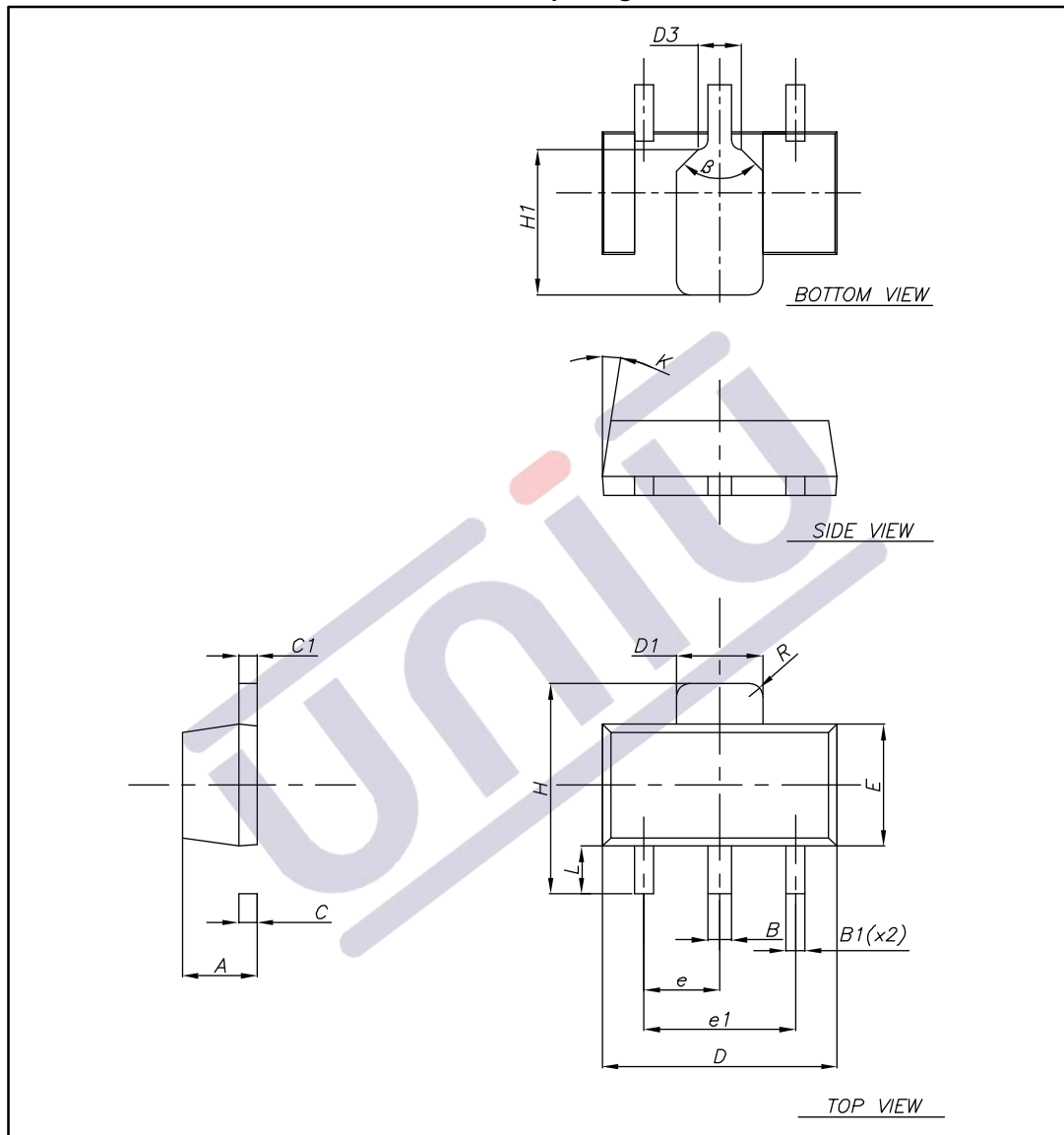


TO-92 tape and reel mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A1			4.80
T			3.80
T1			1.60
T2			2.30
d	0.45	0.47	0.48
P0	12.50	12.70	12.90
P2	5.65	6.35	7.05
F1, F2	2.40	2.50	2.94
F3	4.98	5.08	5.48
delta H	-2.00		2.00
W	17.50	18.00	19.00
W0	5.5	6.00	6.5
W1	8.50	9.00	9.25
W2			0.50
H		18.50	21
H3	0.5	1	2
H0	15.50	16.00	18.8
H1		25.0	27.0
D0	3.80	4.00	4.20
t			0.90
L			11.00
l1	3.00		
delta P	-1.00		1.00
Ø1	352	355	358
Ø2	28	30	32
u	44	47	50

## SOT-89 package information

SOT-89 package outline



SOT-89 mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	1.40		1.60
B	0.44		0.56
B1	0.36		0.48
C	0.35		0.44
C1	0.35		0.44
D	4.40		4.60
D1	1.62		1.83
D3		0.90	
E	2.29		2.60
e	1.42		1.57
e1	2.92		3.07
H	3.94		4.25
H1	2.70		3.10
K	1°		8°
L	0.89		120
R		0.25	
β		90°	

SOT-89 carrier tape outline

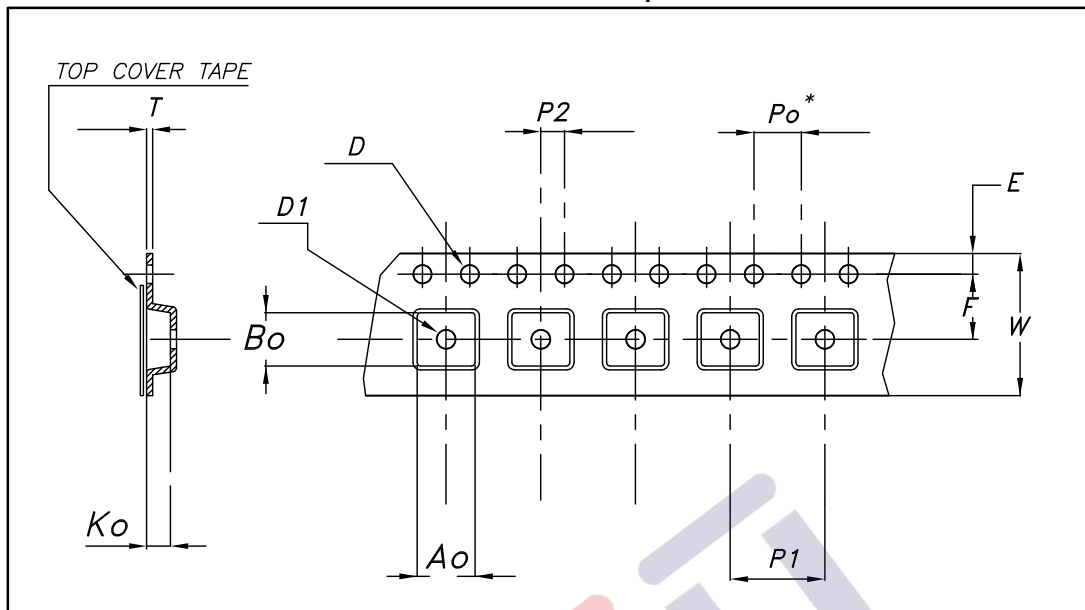


Table : SOT8-89 carrier tape mechanical data

Dim.	mm	
	Value	Tolerance
Ao	4.91	± 0.10
Bo	4.52	± 0.10
Ko	1.90	± 0.10
F	5.50	± 0.10
E	1.75	± 0.10
W	12	± 0.30
P2	2	± 0.10
Po	4	± 0.10
P1	8	± 0.10
T	0.30	± 0.10
D	Ø 1.55	± 0.05
D1	Ø 1.60	± 0.10

## 1.版本记录

DATE	REV.	DESCRIPTION
2018/04/19	1.0	First Release
2021/11/10	1.1	Layout adjustment

## 2.免责声明

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