



ZHEJIANG UNI-NE Technology CO., LTD

浙江宇力微新能源科技有限公司



78S12M Data Sheet

V 1.1

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Positive voltage regulators

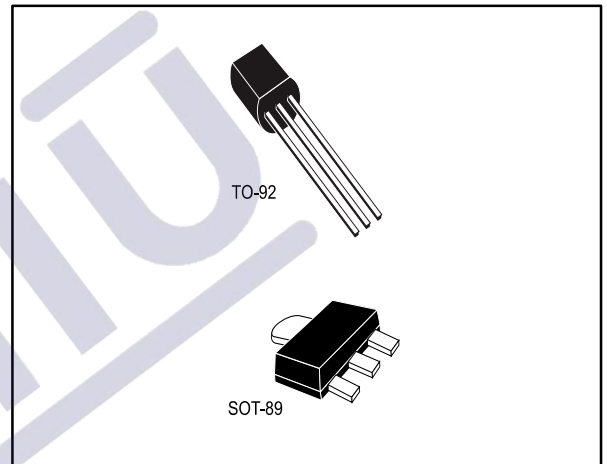
Description

The 78S12M 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 120 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 78S12M series used as Zener diode/resistor combination replacement, offers e improvement along with lower quiescent current and lower noise.

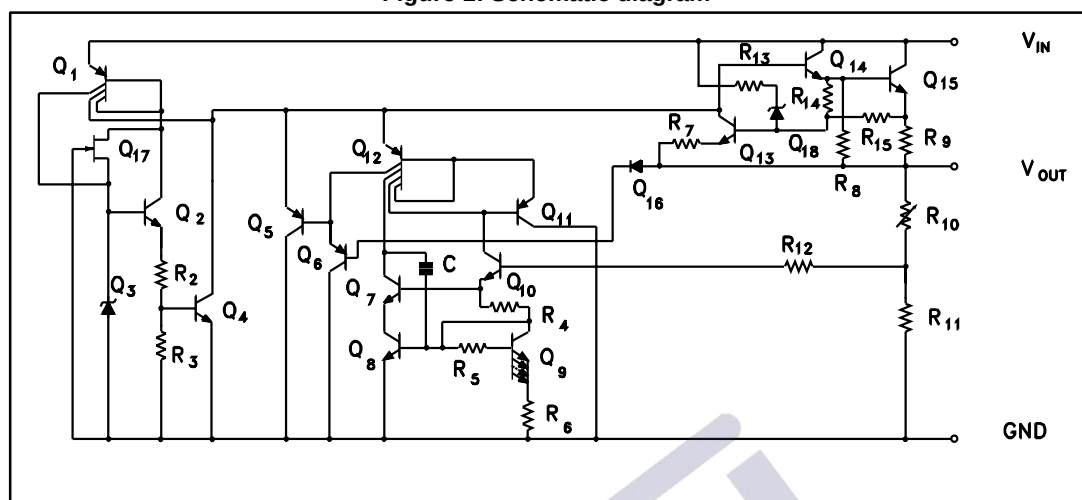
Features

- Output current up to 120 mA
- Output voltages of 12V
- thermal overload protection
- Internal Short Circuit Current Limiting
- 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)

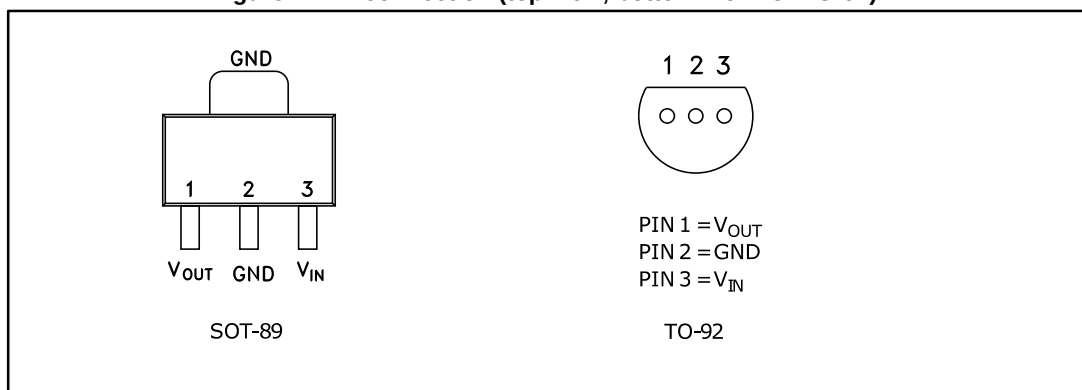
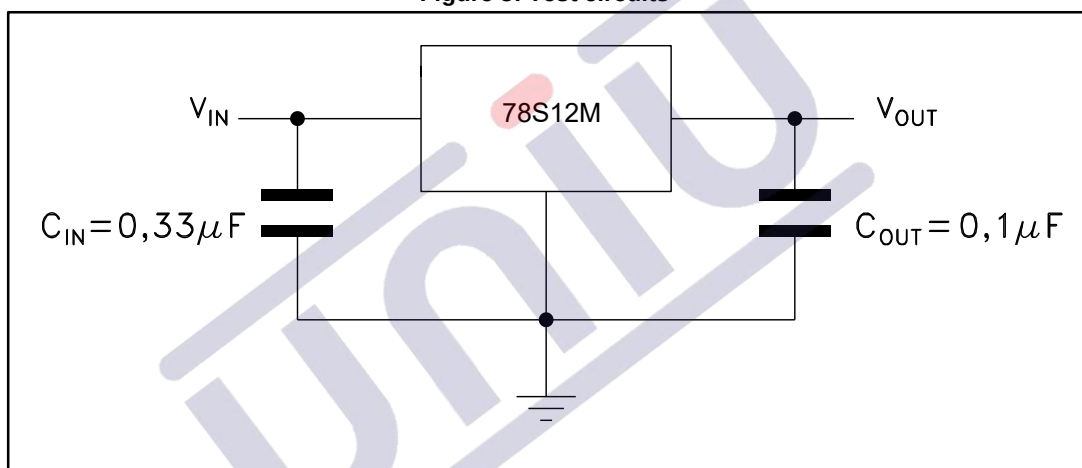


Figure 3: Test circuits



Maximum ratings

absolute maximum ratings over operating temperature range (unless otherwise noted)

78S12M	PARAMETER	UNIT
Input voltage, V_I	35	V
Virtual junction temperature range, T_J	150	°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds	260	°C
Storage temperature range, T_{STG}	-65 to 150	°C

recommended operating conditions

78S12M	MIN	MAX	UNIT
Input voltage, V_I	8	20	V
Output current, I_O		100	mA
Operating virtual junction temperature, T_J	0		°C

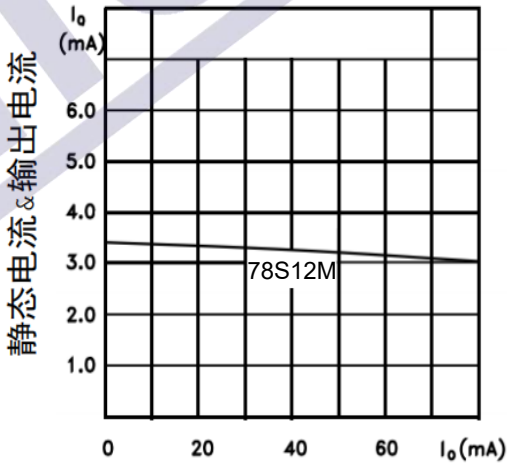
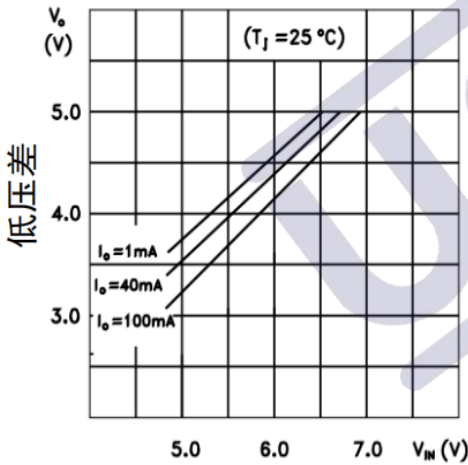
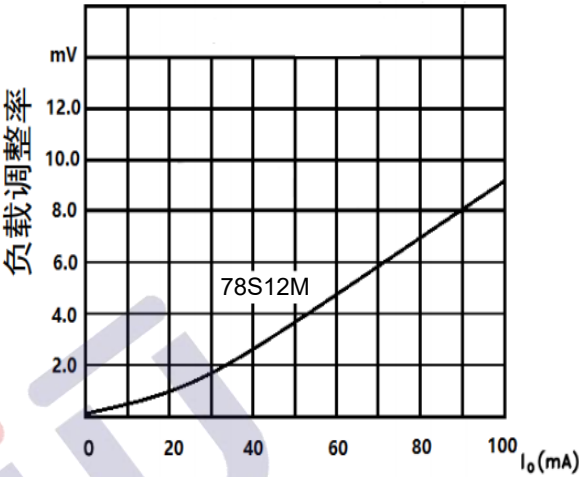
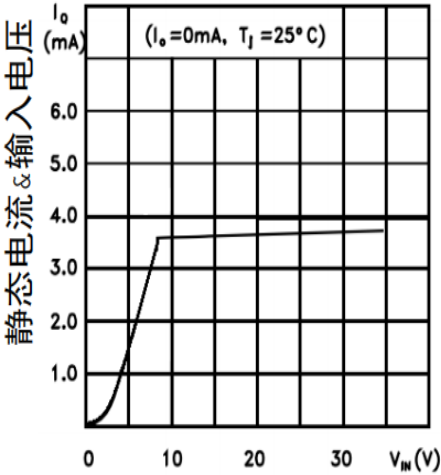
Electrical characteristics

electrical characteristics at specified virtual junction temperature, $V_I = 19V$,
 $I_O = 40mA$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS	T ①	78S12M			UNIT
			MIN	TYP	MAX	
Output voltage		25°C	11.5	12	12.5	V
	$I_O = 1\text{ mA to }40\text{ mA}$, $V_I = 14V\text{ to }27V$	Full range	11.4	12	12.6	
	$I_O = 1\text{ mA to }70\text{ mA}$	Full range	11.4	12	12.6	
Input voltage regulation	$V_I = 14.5V\text{ to }27V$	25°C		55	250	mV
	$V_I = 16V\text{ to }27V$			49	200	
Ripple rejection	$V_I = 15V\text{ to }25V$, $f = 120\text{ Hz}$	25°C	37	42		dB
Output voltage regulation	$I_O = 1\text{ mA to }100\text{ mA}$	25°C		22	100	mV
	$I_O = 1\text{ mA to }40\text{ mA}$			13	50	
Output noise voltage	$f = 10\text{ Hz to }100\text{ kHz}$	25°C		70		μV
Dropout voltage		25°C		1.7		V
Bias current		25°C		4.3	6	mA
		125°C			5.5	
Bias current change	$V_I = 16V\text{ to }27V$	Full range			1.5	mA
	$I_O = 1\text{ mA to }40\text{ mA}$				0.1	

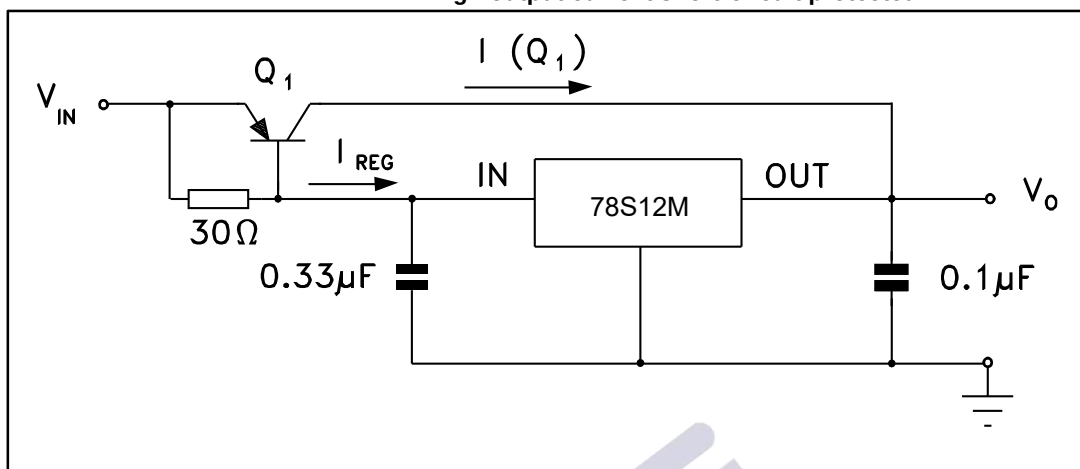
① Pulse-testing techniques maintain T_J as close to T_A as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output. Full range for the 78S12M is $T_J = 0^\circ\text{C to }70^\circ\text{C}$

Typical performance

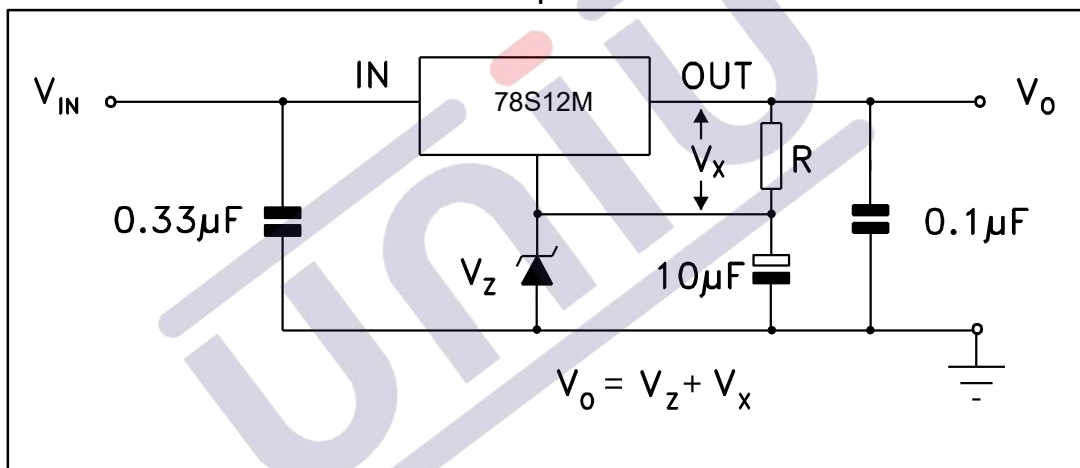


Typical application

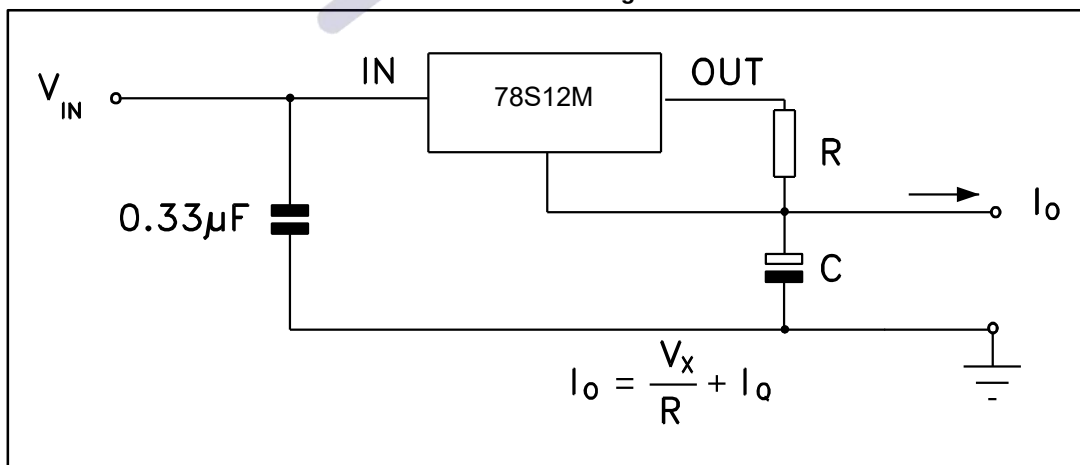
High output current short-circuit protected



Output boost circuit



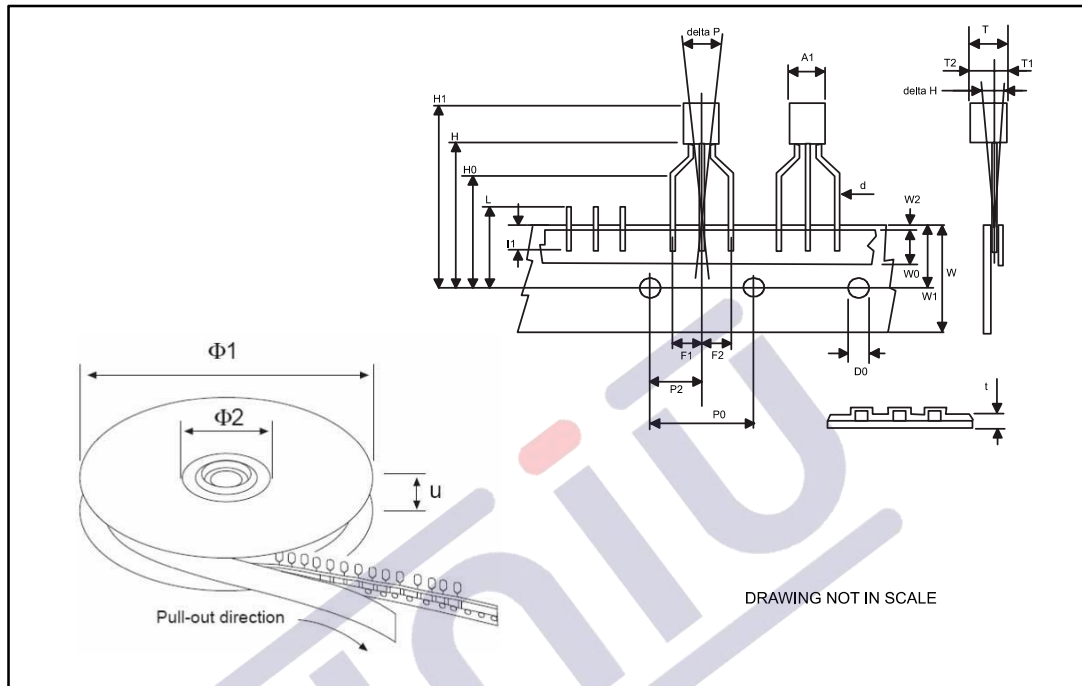
Current regulator



Package information

TO-92 packing information

: TO-92 tape and reel outline

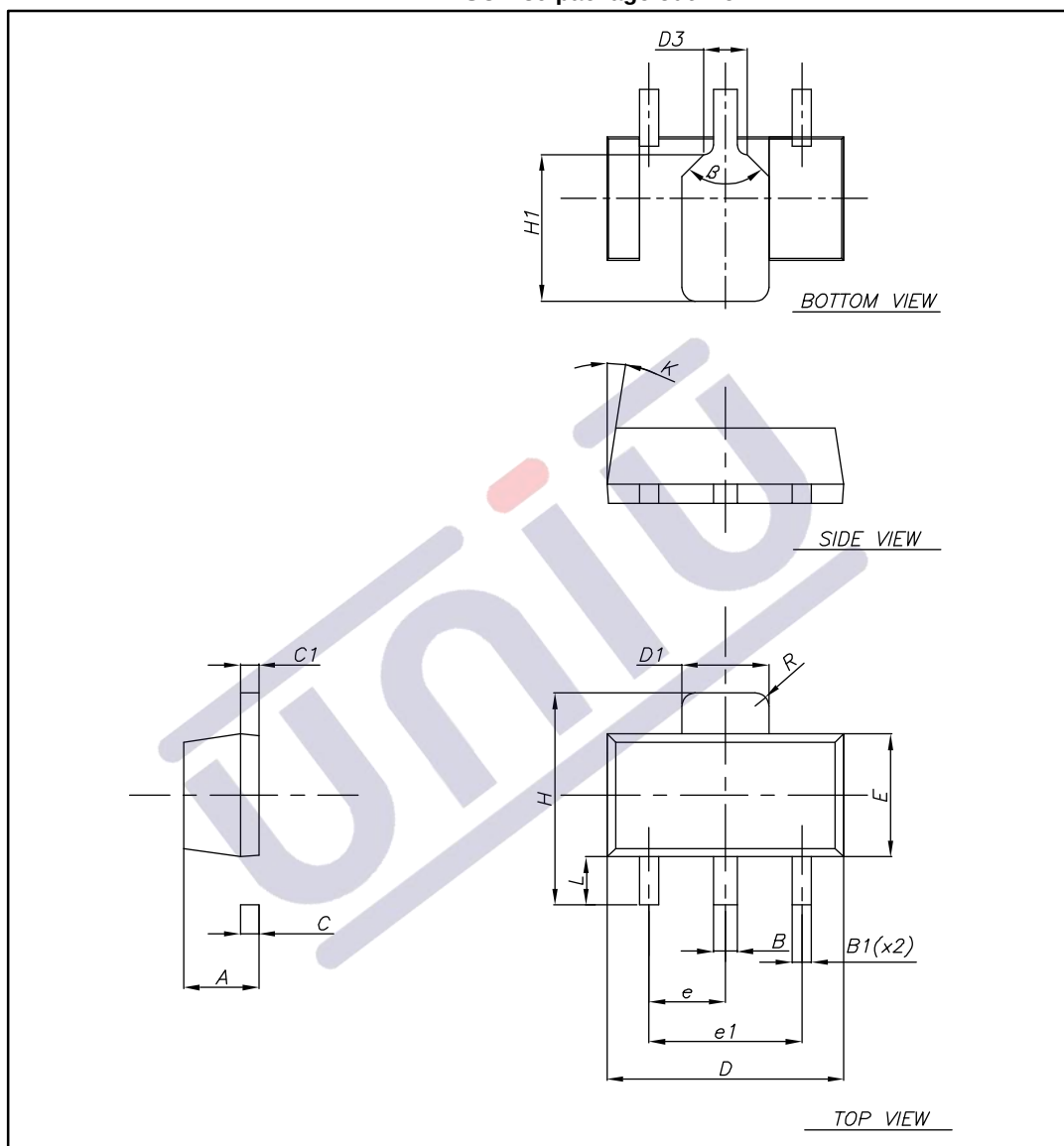


TO-92 tape and reel mechanical data

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

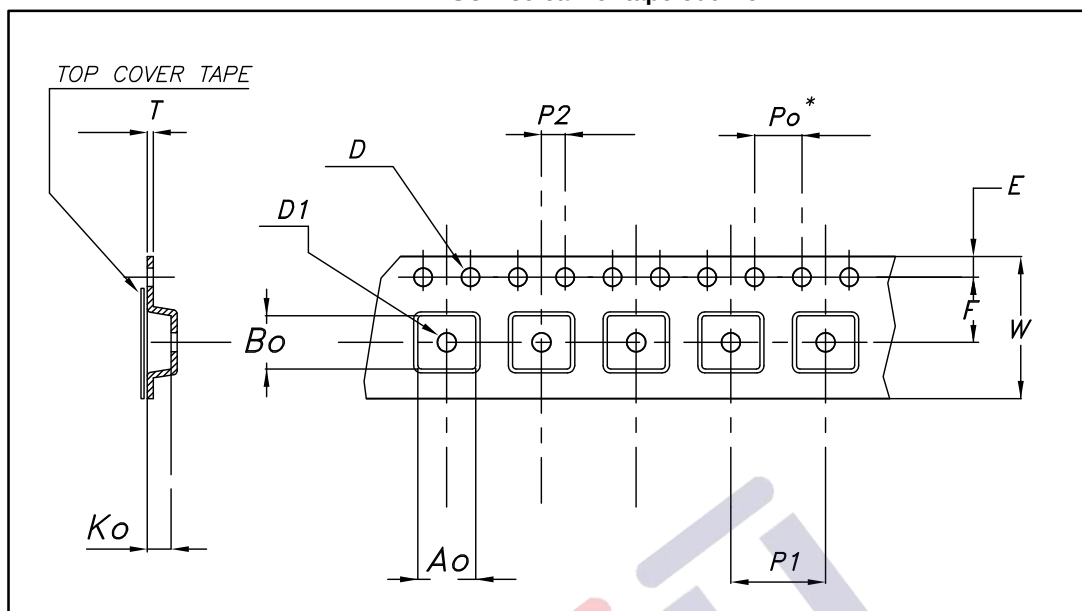


Table : SOT8-89 carrier tape mechanical data

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	$\varnothing 1.55$	± 0.05
D1	$\varnothing 1.60$	± 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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