

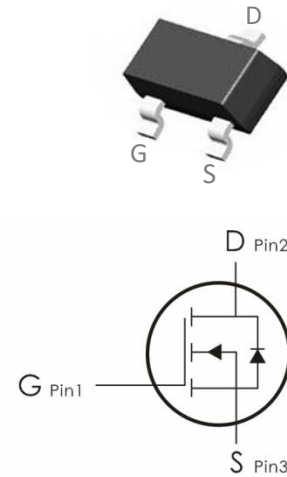
Description:

This N-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=30V, I_D=4A, R_{DS(ON)} < 50m\ \Omega @ V_{GS}=10V$ (Typ: $43m\ \Omega$)
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(ON)}$.
- 5) Excellent package for good heat dissipation.
- 6) MSL3



Package Marking and Ordering Information:

Part NO.	Marking	Package	Packing
DO3402A	3402A	SOT-23	3000 pcs/Reel

Absolute Maximum Ratings: ($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current ¹	4	A
	Continuous Drain Current $T_A=100^\circ\text{C}$ ¹	2.8	
I_{DM}	Pulsed Drain Current ²	16	
P_D	Power Dissipation	1.2	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+150	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	103	$^\circ\text{C}/\text{W}$

Electrical Characteristics: ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=30V$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0A$	---	---	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	0.4	0.82	1	V
$R_{DS(on)}$	Drain-Source On Resistance ³	$V_{GS}=10V, I_D=4A$	---	43	50	$\text{m}\Omega$
		$V_{GS}=4.5V, I_D=3A$	---	46	55	$\text{m}\Omega$
		$V_{GS}=2.5V, I_D=2A$	---	55	70	$\text{m}\Omega$
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	---	235	---	pF
C_{oss}	Output Capacitance		---	37	--	
C_{rss}	Reverse Transfer Capacitance		---	30	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=15V, I_D=2A,$ $R_{ENG}=3\ \Omega, V_{GS}=4.5V$	---	4.2	---	ns
t_r	Rise Time		---	13.6	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	43	---	ns
t_f	Fall Time		---	17.8	---	ns
Q_g	Total Gate Charge	$V_{GS}=4.5V, V_{DS}=15V,$ $I_D=2A$	---	4.7	---	nc
Q_{gs}	Gate-Source Charge		---	1.05	---	nc
Q_{gd}	Gate-Drain "Miller" Charge		---	1.05	---	nc
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_{SD}=4A$	---	---	1.2	V
T_{rr}	Reverse Recovery Time	$I_F=2A,$	---	6	---	ns
Q_{rr}	Reverse Recovery Charge	$di/dt=100A/us$	---	1	---	nc
I_S	Continuous Drain Current	$V_D=V_G=0V$	---	---	4	A
I_{SM}	Pulsed Drain Current	$V_D=V_G=0V$	---	---	16	A

Notes:

1. Computed continuous current assumes the condition of $T_{j,Max}$ while the actual continuous current depends on the thermal & electro-mechanical application board design
2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$.

Typical Characteristics: ($T_A=25^\circ C$ unless oth

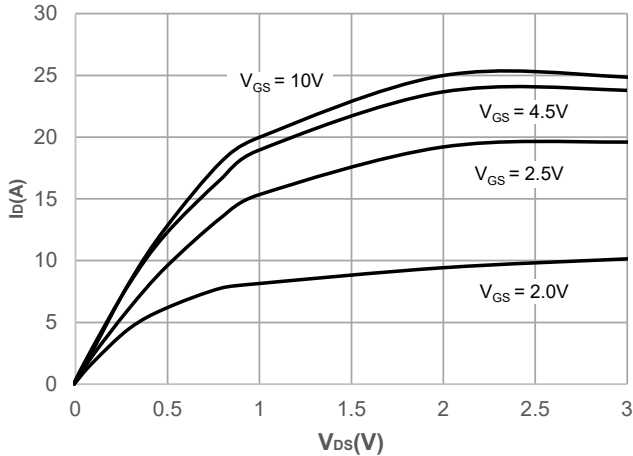


Figure 1: Output Characteristics

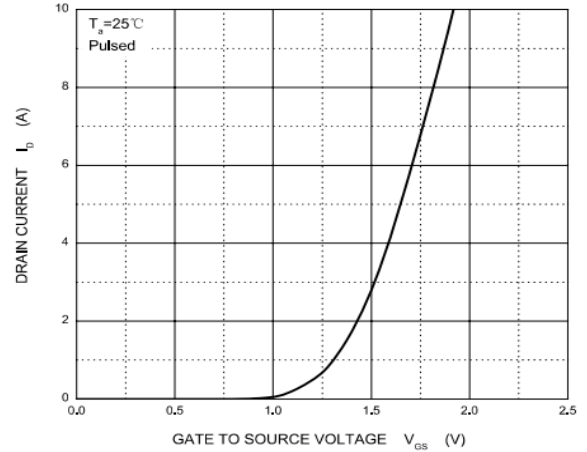


Figure 2: Typical Transfer Characteristics

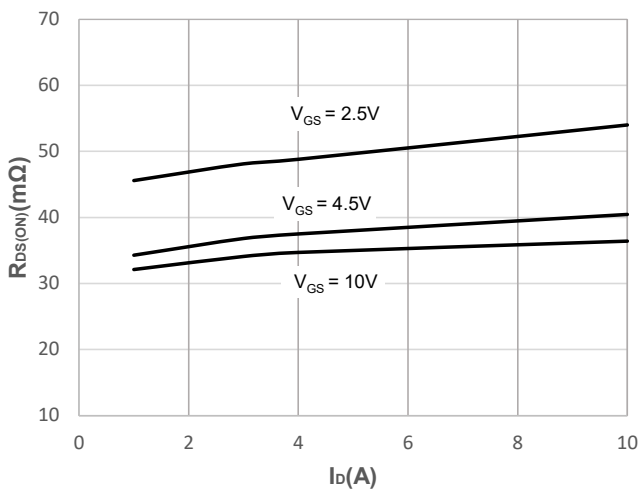


Figure 3: On-resistance vs. Drain Current

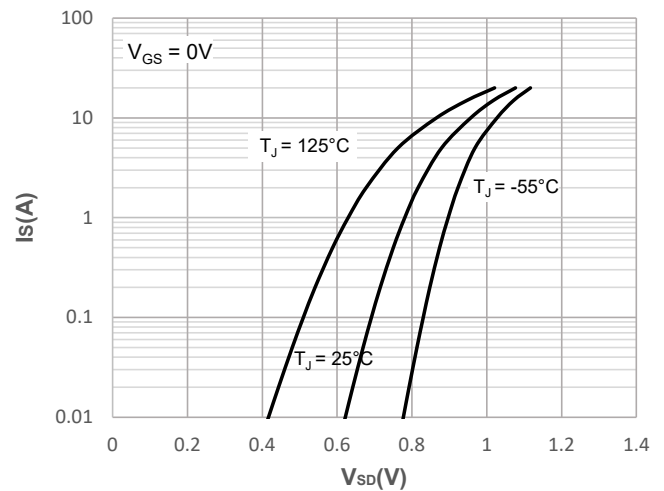


Figure 4: Body Diode Characteristics

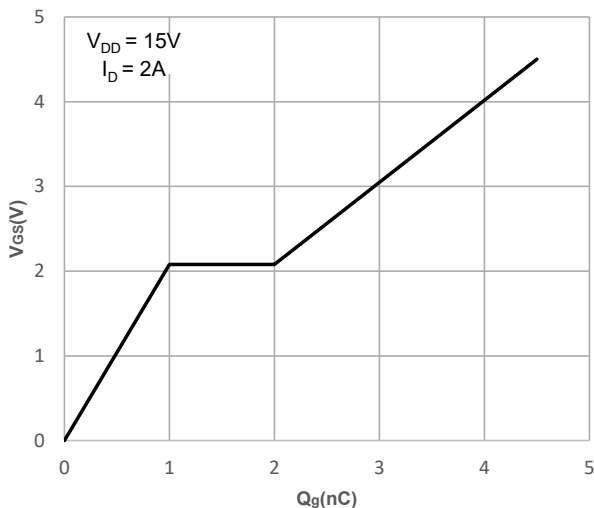


Figure 5: Gate Charge Characteristics

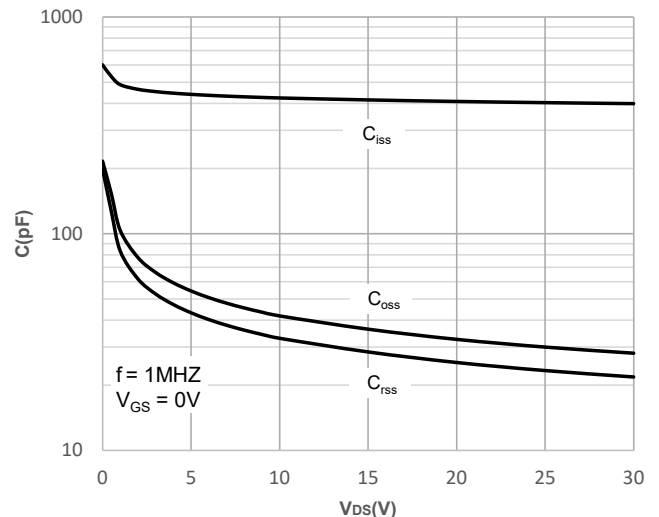


Figure 6: Capacitance Characteristics

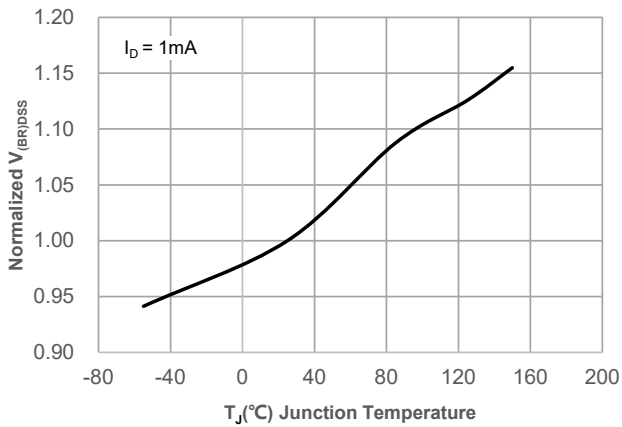


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

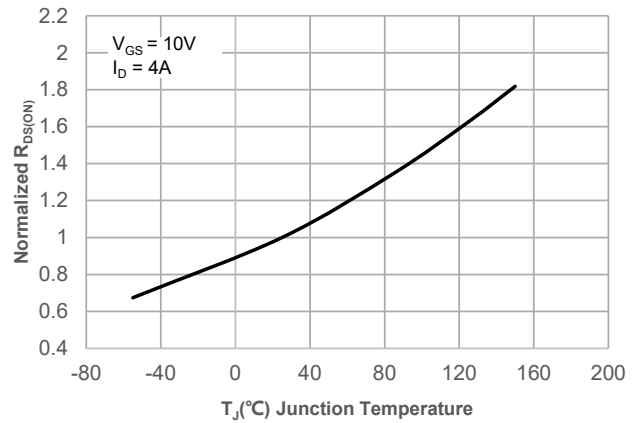


Figure 8: Normalized on Resistance vs. Junction Temperature

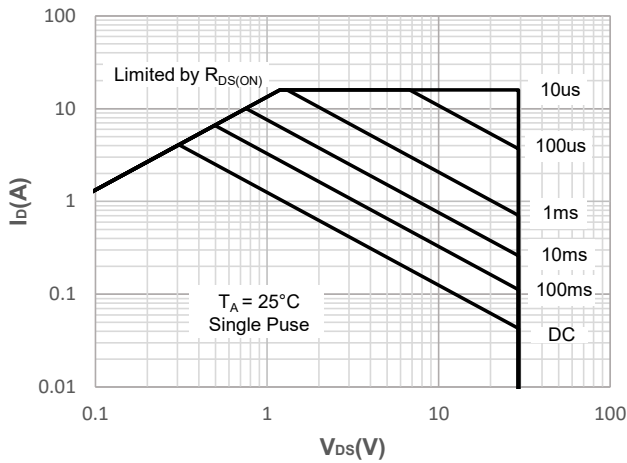


Figure 9: Maximum Safe Operating Area

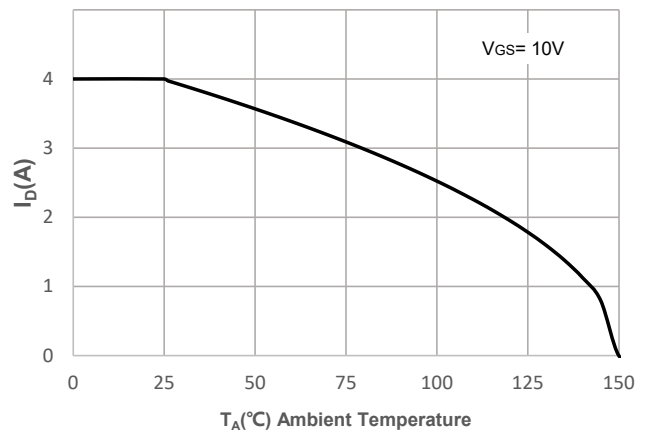


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

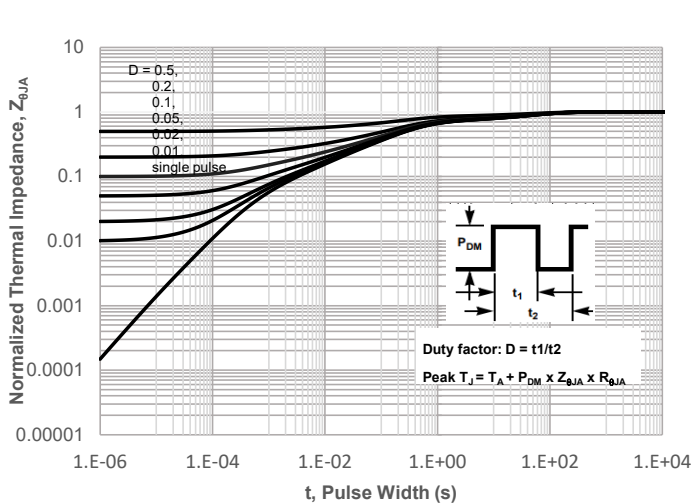


Figure 11: Normalized Maximum Transient Thermal Impedance

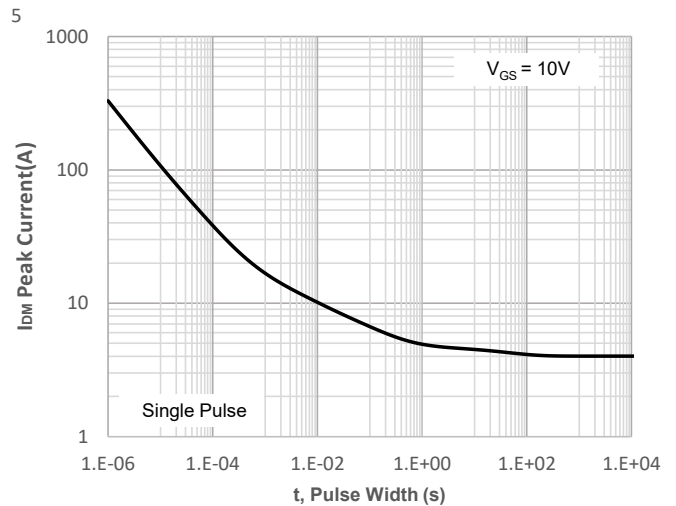
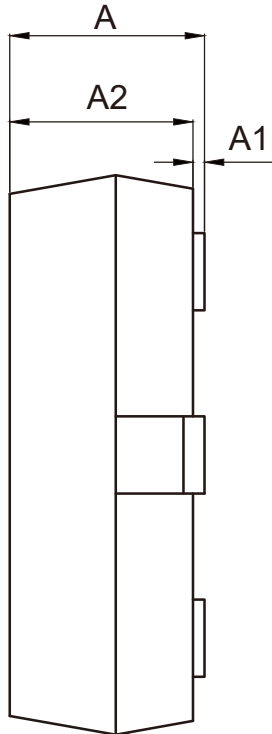
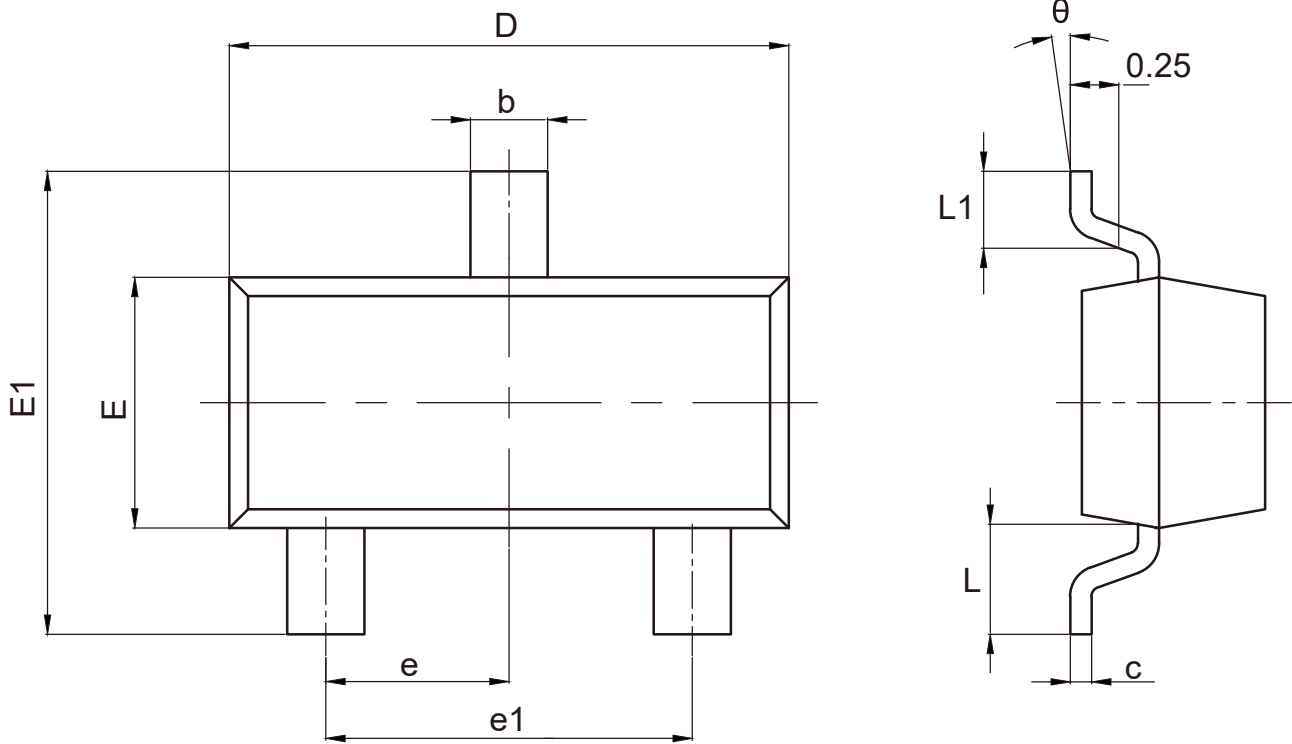


Figure 12: Peak Current Capacity

SOT-23 Package Outline Data

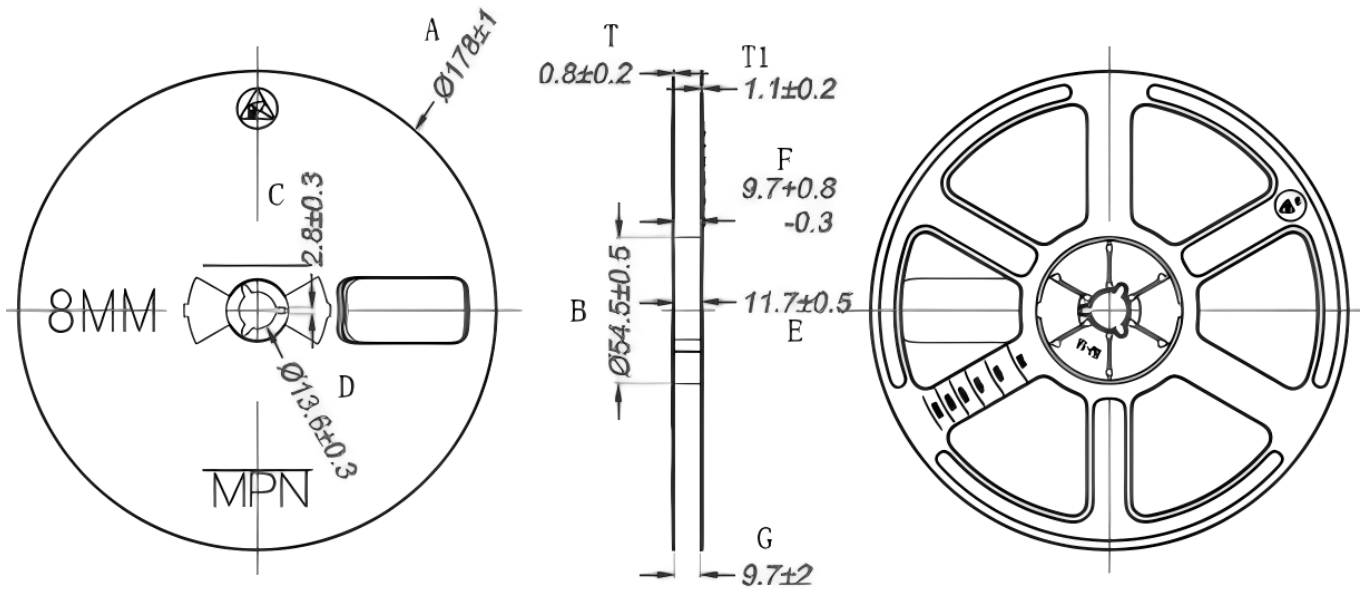


COMMON DIMENSIONS			
CUNITS MEASURE=MILLIMETER			
SYMBOL	MIN	NOM	MAX
A	0.900	--	1.150
A1	0.000	--	0.100
A2	0.900	--	1.050
c	0.100	--	0.200
b	0.300	0.400	0.500
D	2.800	2.900	3.000
E	1.200	--	1.400
E1	2.250	--	2.550
e	0.950TYP		
e1	1.800	1.900	2.000
L	0.550REF		
L1	0.300	0.400	0.500
θ	0°	--	8°

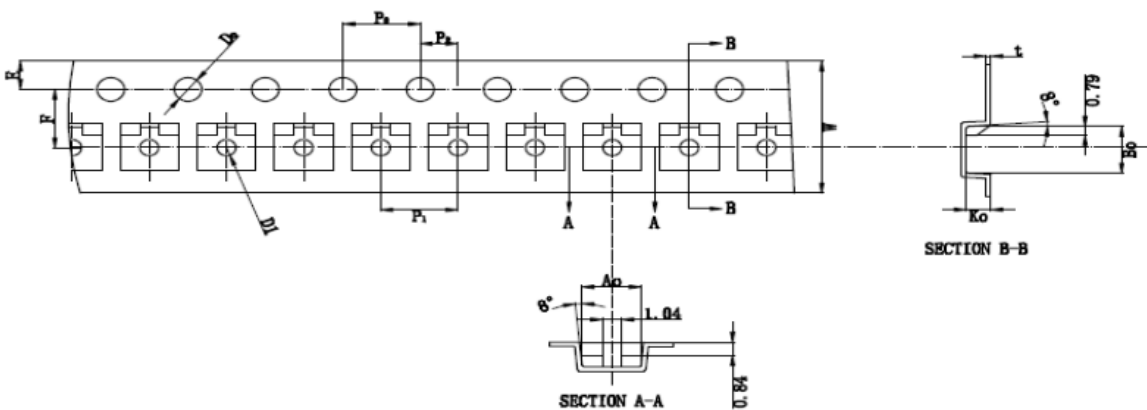
Unit:mm

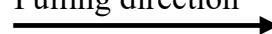
Tape & Reel Information

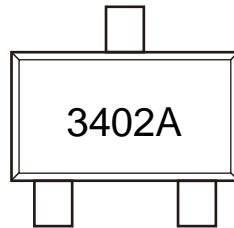
Dimensions in mm



PKG TYPE	W	P	E	F	D	D1	Po	Po10	P2	A0	B0	K0	T
SOT-23	8.00	4.00	1.75	3.50	1.55	1.00	4.00	40.00	2.00	3.17	2.77	1.28	0.20
Tolerance	+0.3/-0.1	± 0.1	± 0.1	± 0.05	± 0.1	± 0.1	± 0.1	± 0.2	± 0.05	± 0.1	± 0.1	± 0.1	± 0.03




Pulling direction 

Marking Information:**Previous Version**

Version	Date	Subjects (major changes since last revision)
2.1	2024-12-09	Release of final version

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