


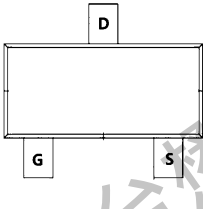
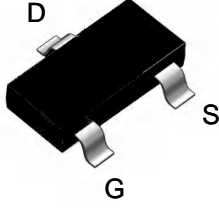
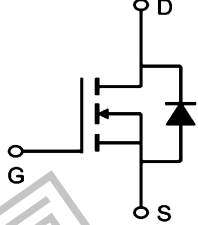


TM02N06I

N-Channel Enhancement Mosfet

<p>General Description</p> <ul style="list-style-type: none"> • Low $R_{DS(ON)}$ • RoHS and Halogen-Free Compliant <p>Applications</p> <ul style="list-style-type: none"> • Load switch • PWM 	<p>General Features</p> <p>$V_{DS} = 60V$ $I_D = 2A$ $R_{DS(ON)} = 140m\Omega (typ.) @ V_{GS} = 10V$</p> <p>100% UIS Tested 100% R_g Tested</p> 
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I: SOT-23

Marking: 2308S

Absolute Maximum Ratings ($T_C = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	2	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	1.7	A
I_{DM}	Pulsed Drain Current ²	15	A
$P_D @ T_A = 25^\circ C$	Total Power Dissipation ¹	1.3	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	---	162	$^\circ C/W$
R_{JC}	Thermal Resistance Junction Case	---	---	$^\circ C/W$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	60	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=60V$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	± 100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	1	2	3	V
$R_{DS(on)}$	Drain-Source on-Resistance ¹	$V_{GS}=10V, I_D=2.2A$	---	140	180	$\text{m}\Omega$
		$V_{GS}=4.5V, I_D=1.8A$	---	160	220	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=30V, V_{GS}=10V,$ $I_D=1A, R_G=30\ \Omega$	---	9	---	ns
t_r	Rise Time		---	9	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	19	---	ns
t_f	Fall Time		---	9	---	ns
Q_g	Total Gate Charge		---	3	---	nC
Q_{gs}	Gate-Source Charge	$V_{GS}=10V, V_{DS}=30V,$ $I_D=2.2A$	---	3	---	nC
Q_{gd}	Gate-Drain "Miller" Charge		---	1	---	nC
Drain-Source Diode Characteristics						
I_S	Source drain current	$V_D=V_G=0V$	---	---	2	A
I_{SM}	Pulse Drain Current Tested	$V_D=V_G=0V$	---	---	15	A
V_{SD}	Forward Voltage	$V_{GS}=0V, I_{SD}=1.7A$	---	---	1.2	V

Notes:

1. Pulse test : $PW \leq 300\ \mu\text{s}$ duty cycle $\leq 2\%$.
2. Guaranteed by design, not subject to production testing.



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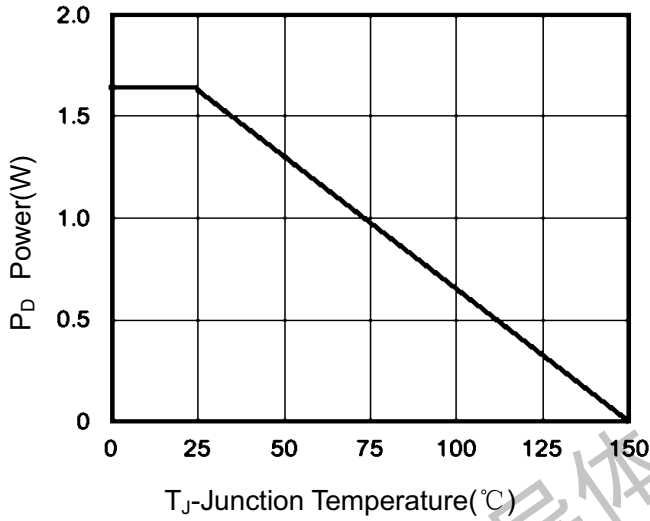


Figure 1 Power Dissipation

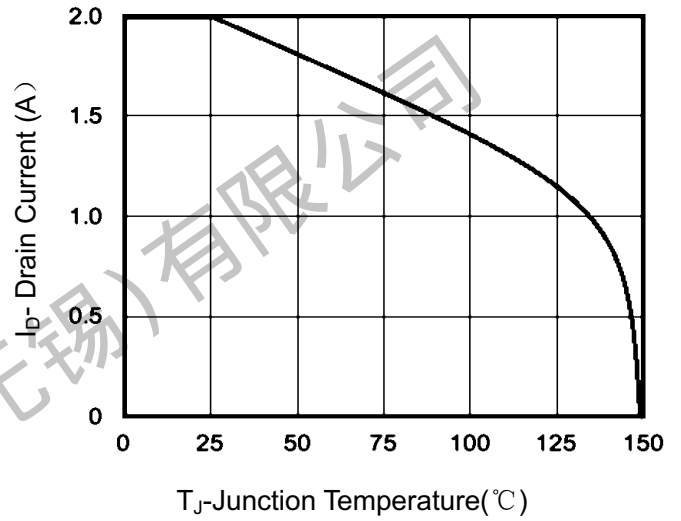


Figure 2 Drain Current

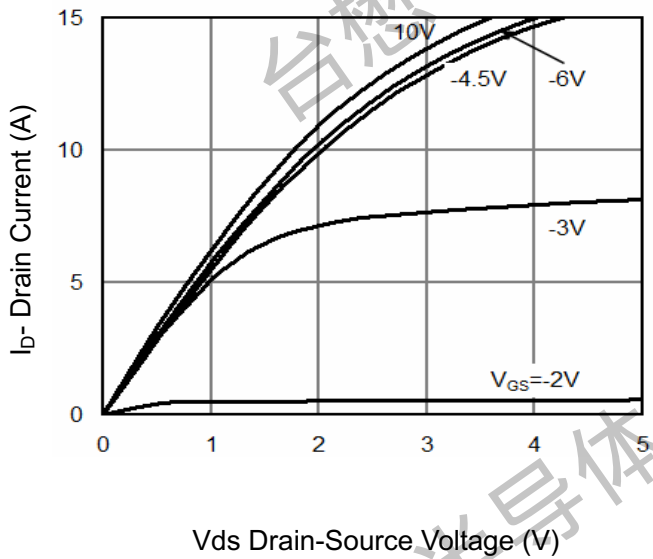


Figure 3 Output Characteristics

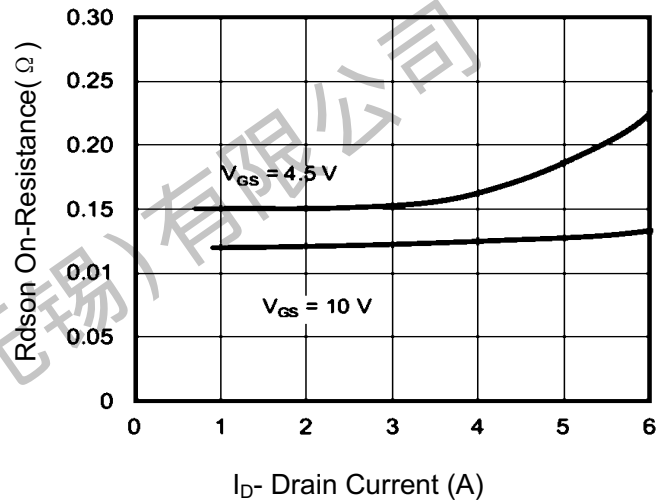


Figure 4 Drain-Source On-Resistance



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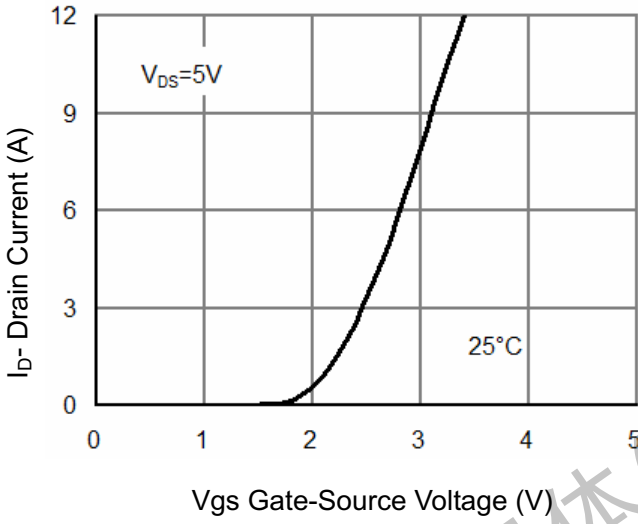


Figure 5 Transfer Characteristics

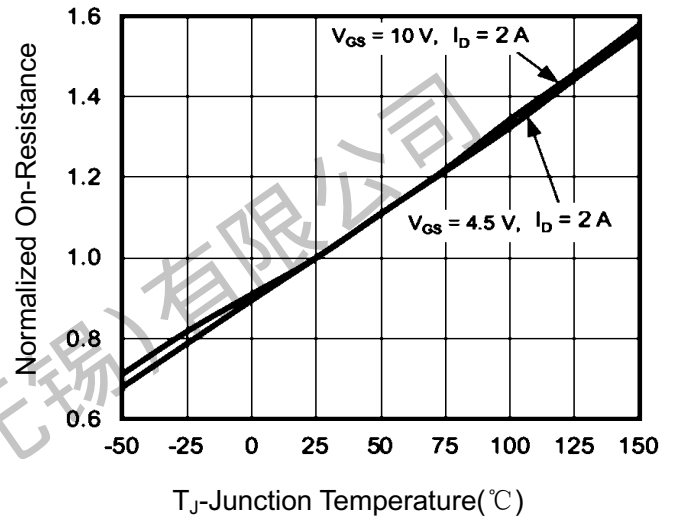


Figure 6 Drain-Source On-Resistance

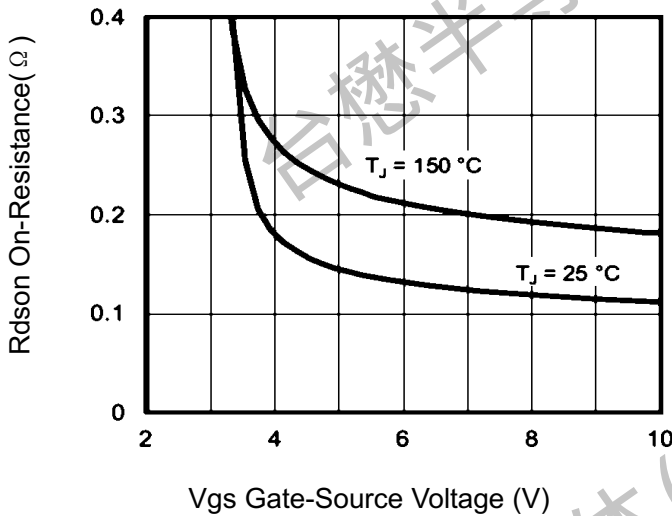


Figure 7 Rdson vs Vgs

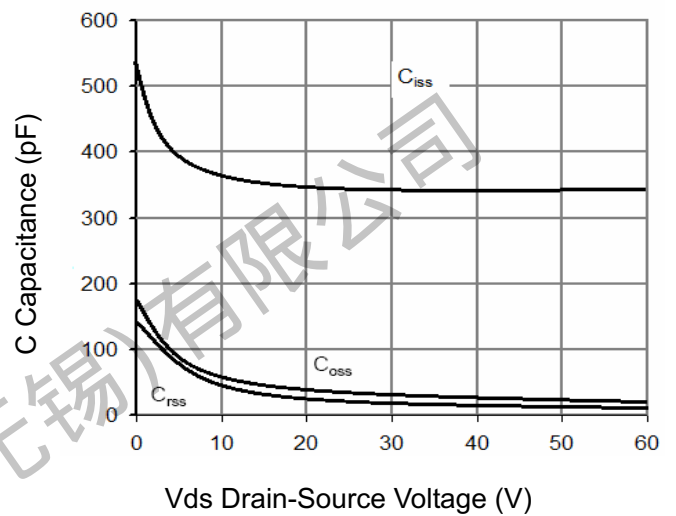


Figure 8 Capacitance vs Vds

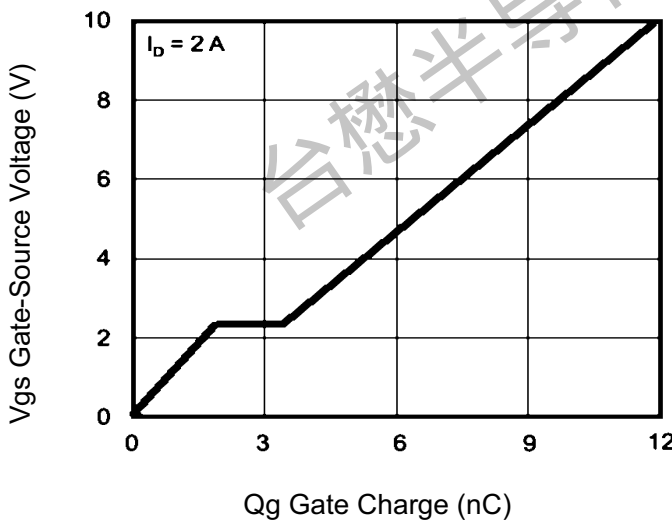


Figure 9 Gate Charge

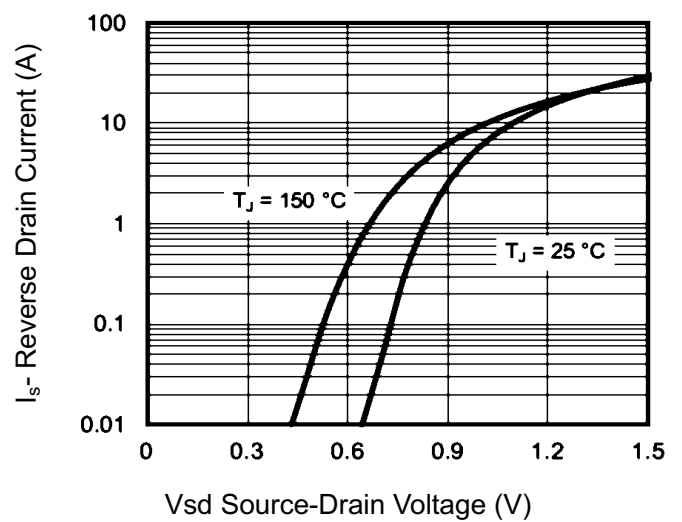


Figure 10 Source- Drain Diode Forward

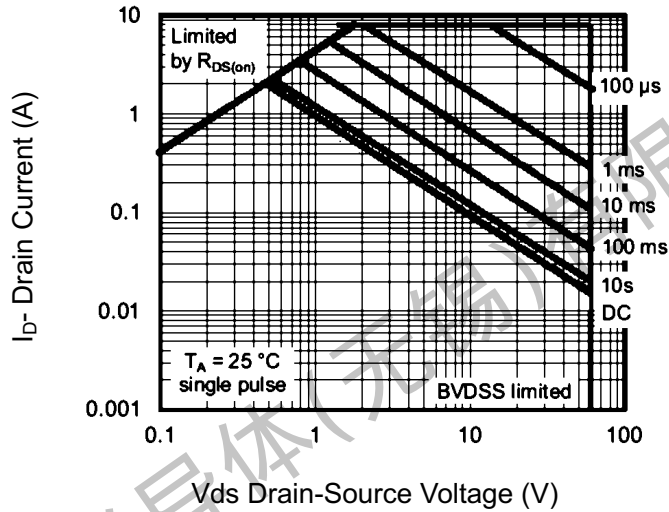


Figure 11 Safe Operation Area

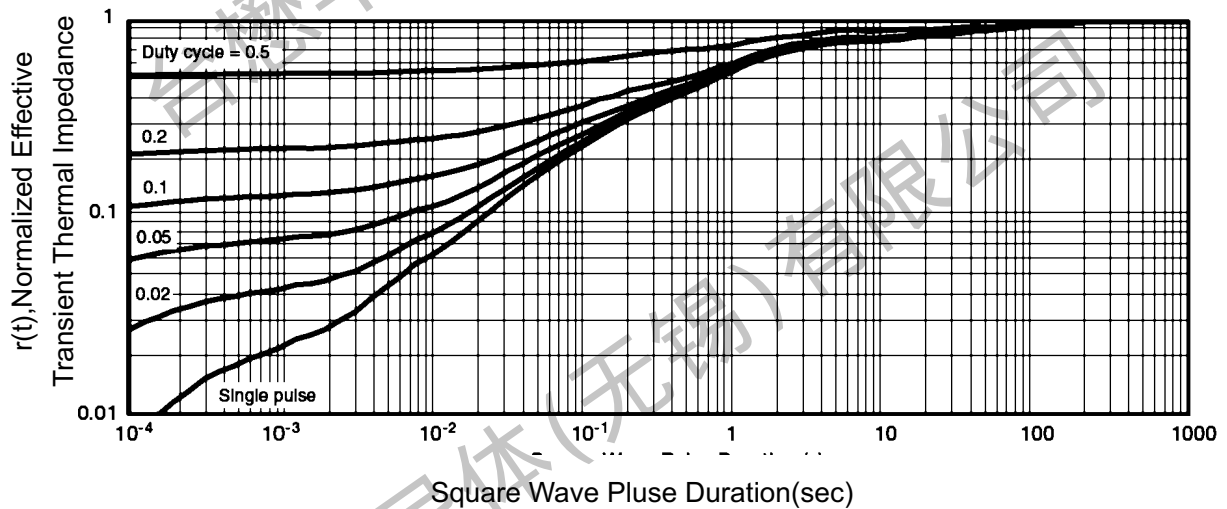


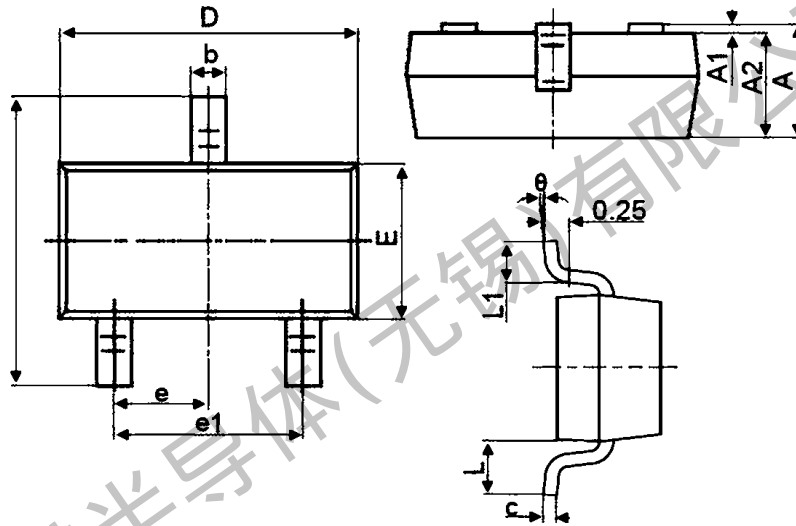
Figure 12 Normalized Maximum Transient Thermal Impedance



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Package Mechanical Data:SOT-23



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

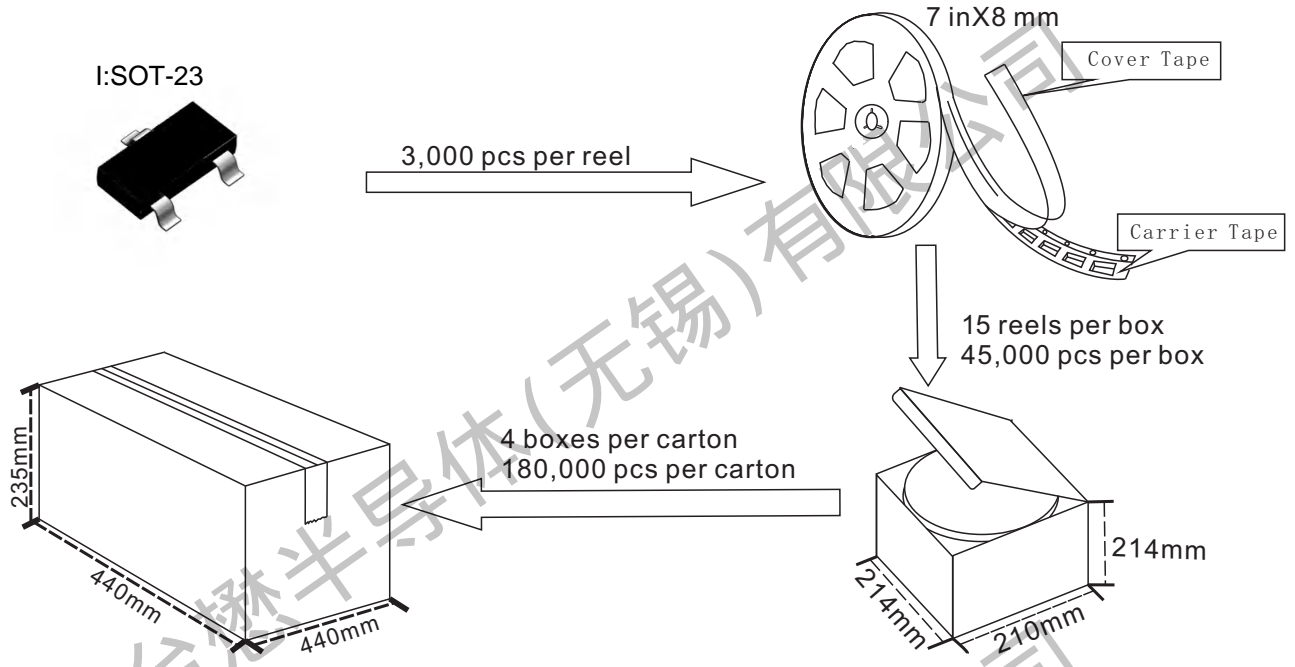


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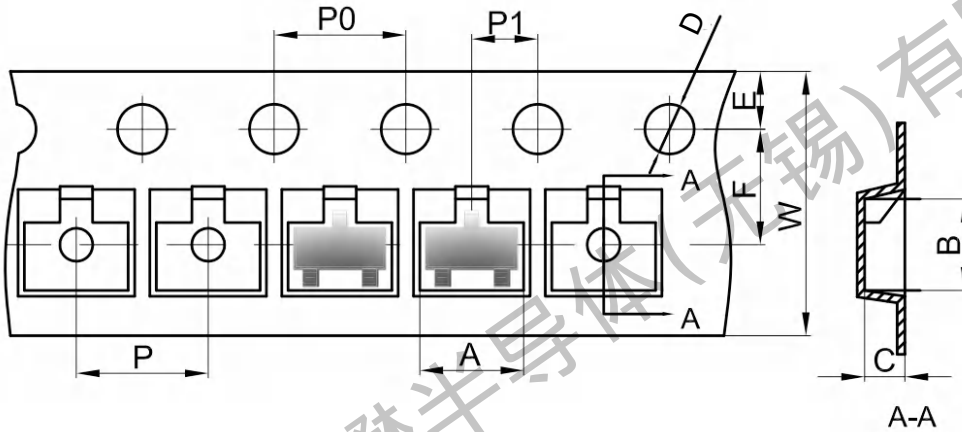
N-Channel Enhancement Mosfet

SOT-23 Packing

1. The method of packaging and dimension are shown as below figure. (Dimension in mm)



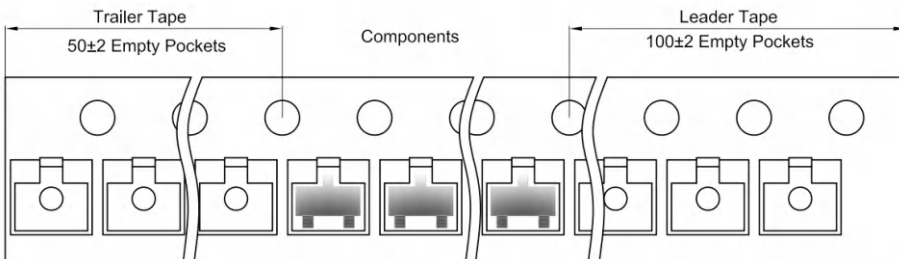
SOT-23 Embossed Carrier Tape



Dimensions are in millimeter

Pkg type	A	B	C	D	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

SOT-23 Tape Leader and Trailer





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Revision history:

Date	Rev	Description	Page
2023.09.20	23.09	Original	