


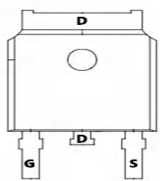
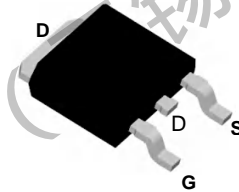
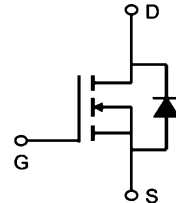


TM150N02D

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>$V_{DS} = 20V$ $I_D = 150A$ $R_{DS(ON)} = 1.9m\Omega (typ.) @ V_{GS} = 4.5V$</p> <p>100% UIS Tested 100% R_g Tested</p> 
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D:TO-252-3L

Marking: 150N02

Absolute Maximum Ratings ($T_c = 25^\circ C$ Unless Otherwise Noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D @ T_c = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 4.5V$	150	A
$I_D @ T_c = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 4.5V$	90	A
I_{DM}	Pulsed Drain Current	375	A
EAS	Single Pulse Avalanche Energy	196	mJ
I_{AS}	Avalanche Current	10	A
P_D	Total Power Dissipation	83	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	---	62	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case	---	6.6	$^\circ C/W$



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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	$V_{GS}=0V, I_D=250\ \mu\text{A}$	20	24	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=20V$	---	---	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	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	0.5	0.7	0.9	V
$R_{DS(on)}$	Drain-Source On Resistance	$V_{GS}=4.5V, I_D=30A$	---	1.9	2.4	$\text{m}\Omega$
		$V_{GS}=2.5V, I_D=20A$	---	2.5	3	$\text{m}\Omega$
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=10V, V_{GS}=0V, f=1\text{MHz}$	---	2015	---	pF
C_{oss}	Output Capacitance		---	390	--	
C_{rss}	Reverse Transfer Capacitance		---	129	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=10V, I_D=30A,$ $R_{ENG}=2.7\ \Omega, V_{GS}=10V$	---	5	---	ns
t_r	Rise Time		---	3	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	30	---	ns
t_f	Fall Time		---	4	---	ns
Q_{gs}	Total Gate Charge	$V_{GS}=4.5V, V_{DS}=10V,$ $I_D=30A$	---	14	---	nc
Q_{gd}	Gate-Source Charge		---	2	---	nc
Q_g	Gate-Drain "Miller" Charge		---	3	---	nc
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_{SD}=30A$	---	0.8	1.2	V
I_S	Continuous Drain Current	$V_D=V_G=0V$	---	---	150	A
I_{SM}	Pulsed Drain Current		---	---	243	A



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Typical Characteristics

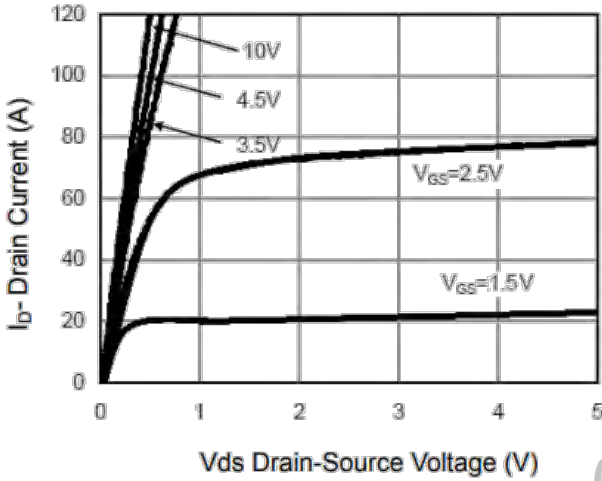


Fig1. Output Characteristics

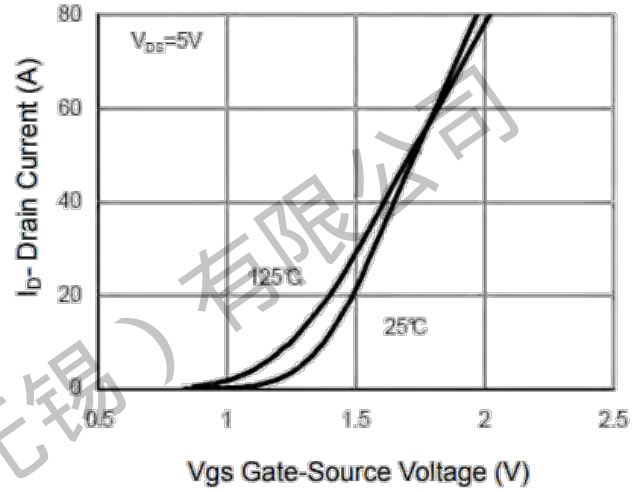


Fig2. Transfer Characteristics

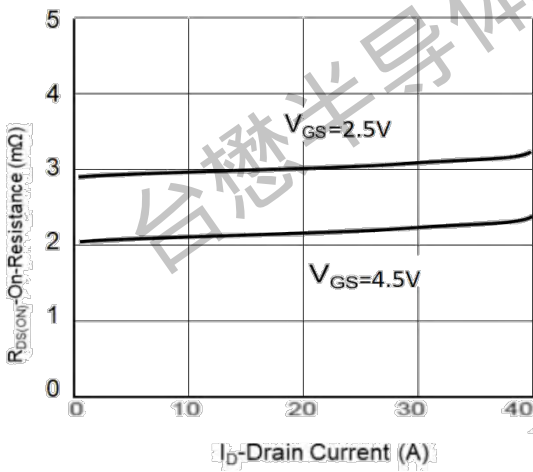


Fig3. Rdson-Drain Current

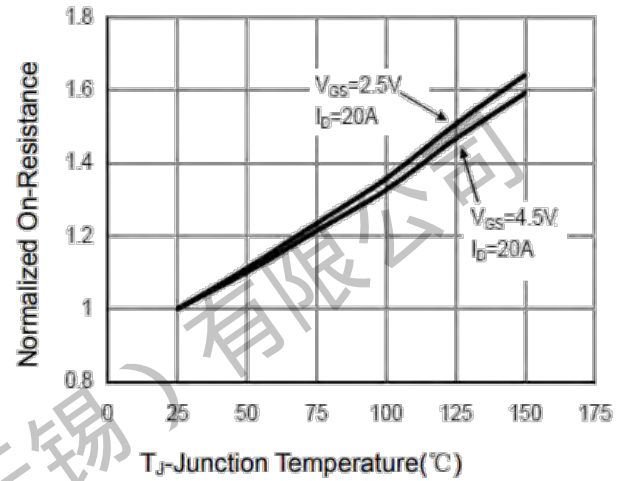


Fig4. Rdson-Junction Temperature

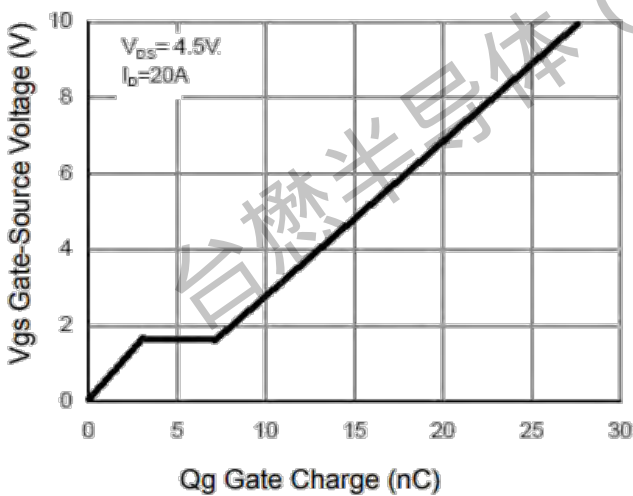


Fig5. Gate Charge

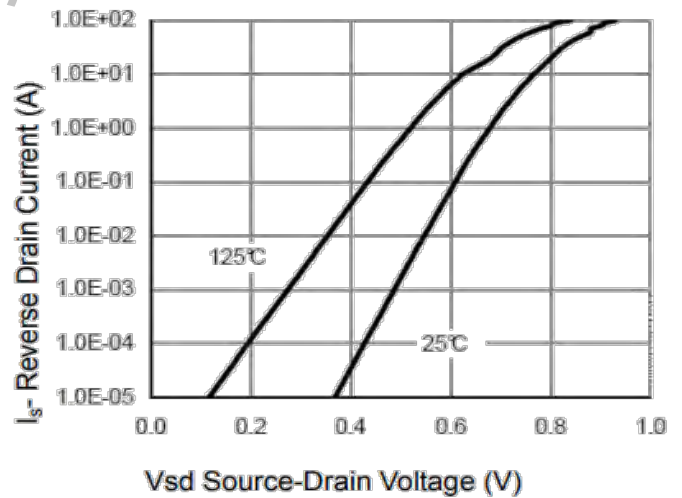


Fig6. Source-Drain Diode Forward



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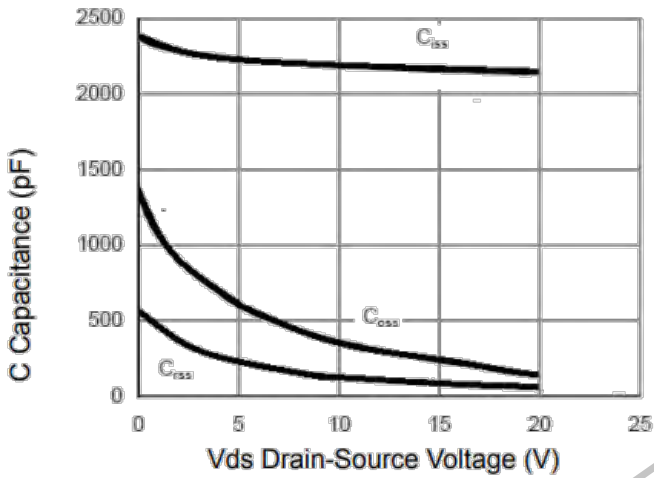


Fig7. Capacitance vs Vds

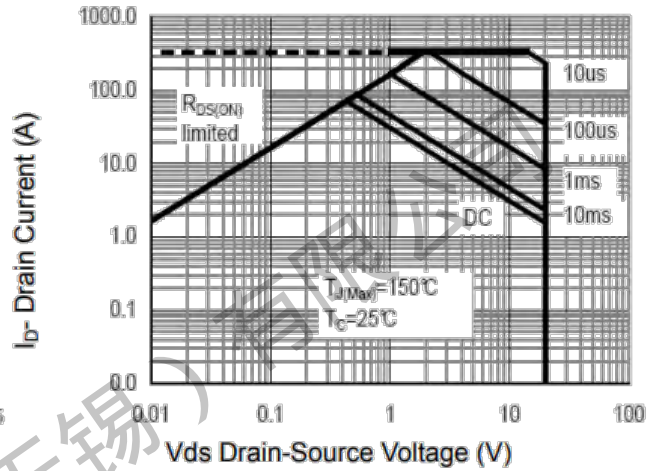


Fig8. Safe Operation Area

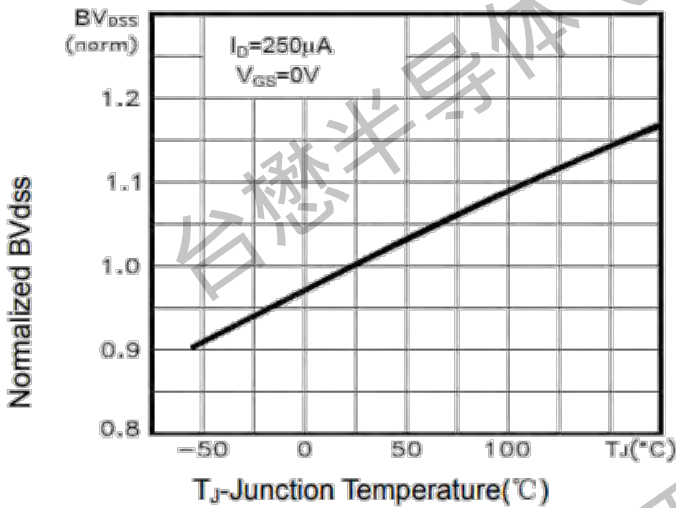


Fig9. BV_{DSS} vs Junction Temperature

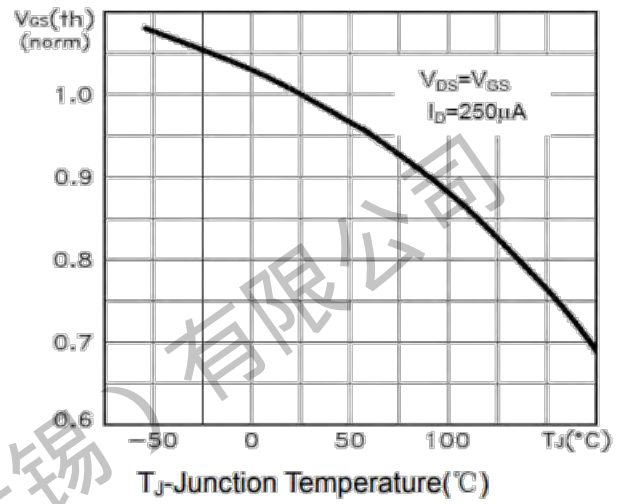


Fig10. V_{GS(th)} vs Junction Temperature

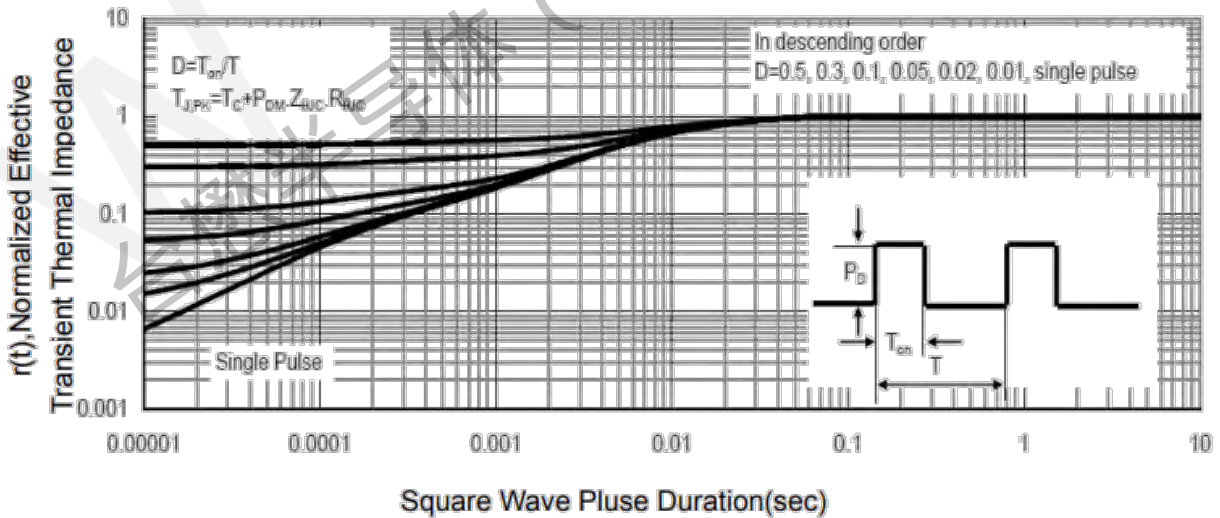
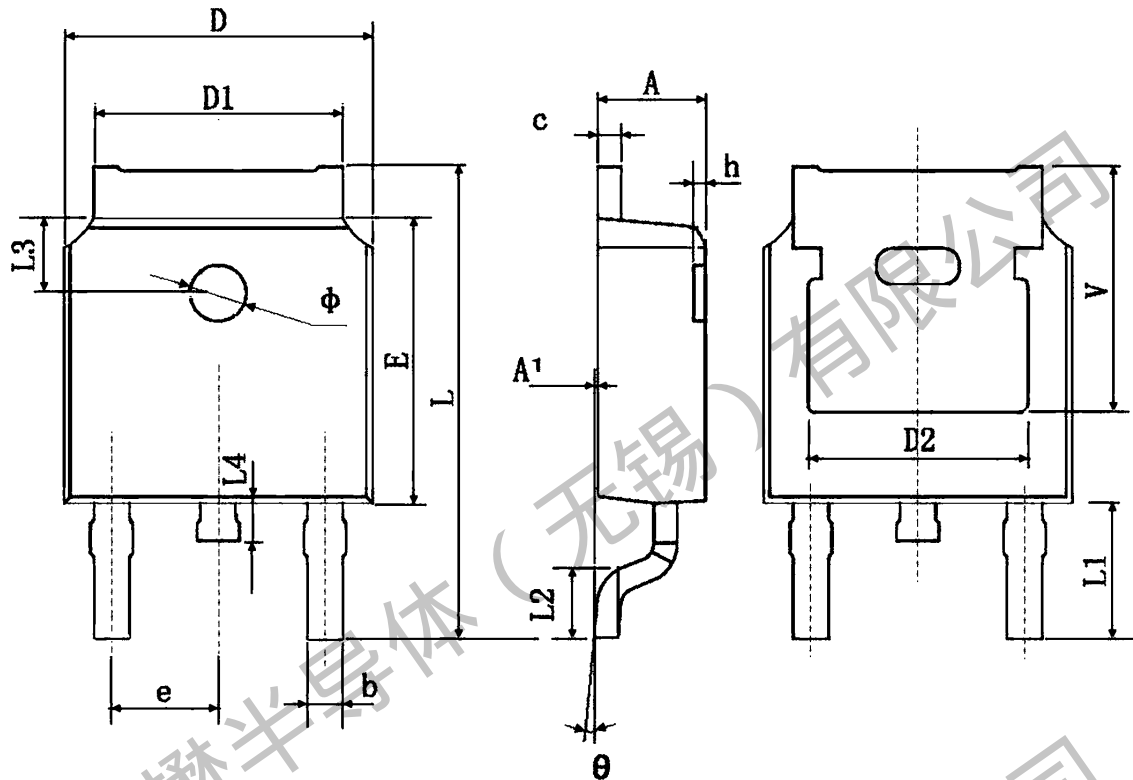


Fig11. Normalized Maximum Transient Thermal Impedance

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Package Mechanical Data: TO-252-3L

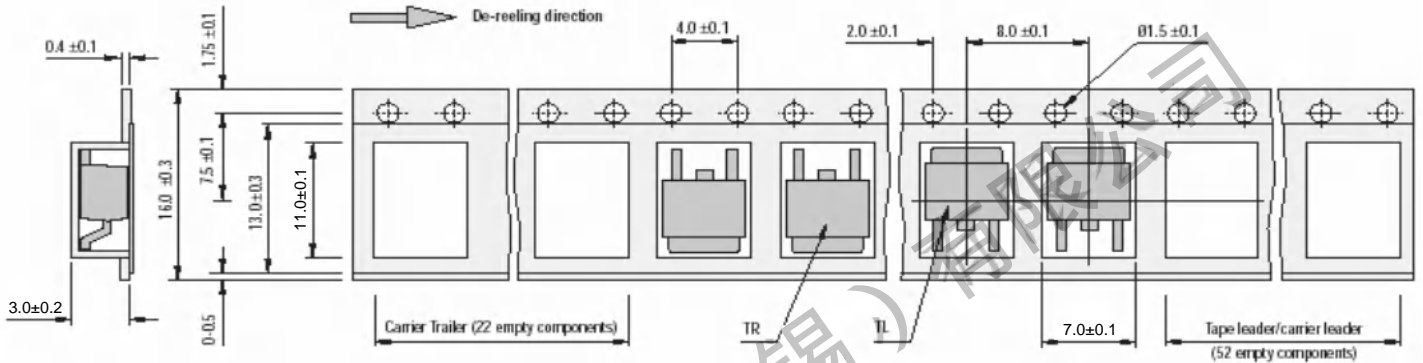


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
v	5.350 TYP.		0.211 TYP.	

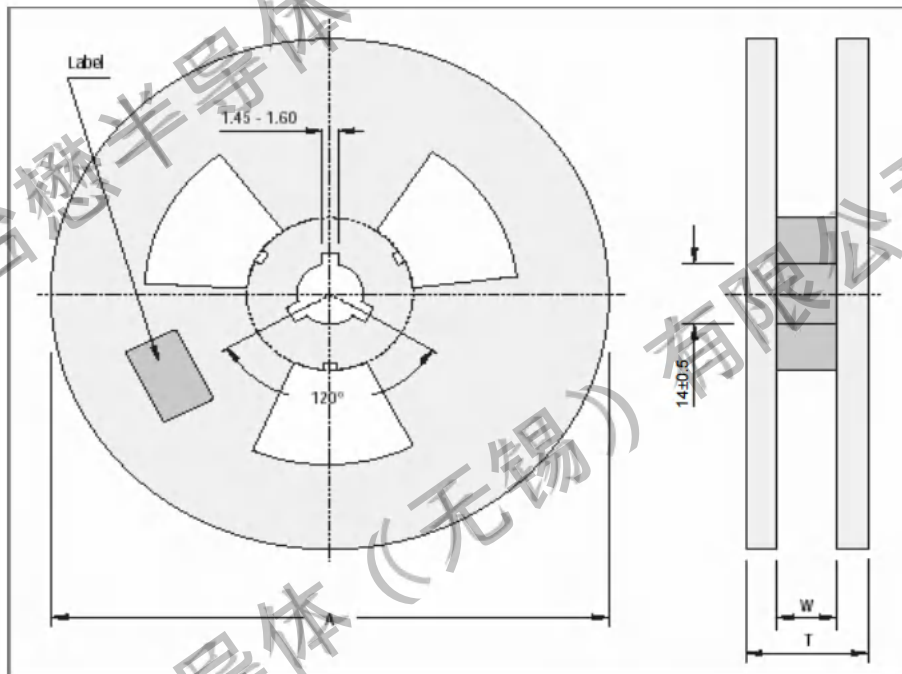
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TO-252-3L Embossed Carrier Tape



TO-252-3L Reel



All Dimensions are in mm.

Reel Specifications				
Package	Tape Width	Reel Dia. A - Max	Inside Thickness W	Reel Thickness T - max
TO-252-3L	16	330	18.0 ± 1.5	20

Packaging Information

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
2,500 pcs	13 inch	5,000 pcs	355×370×50	25,000 pcs	380×275×380	

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Revision history:

Date	Rev	Description	Page
2024.06.14	24.06	Original	