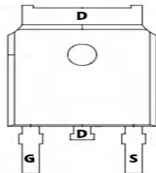
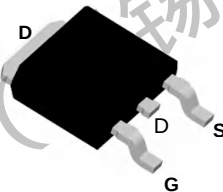
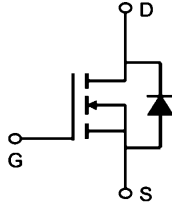




TM120N03D

N-Channel Enhancement Mosfet

General Description • Low $R_{DS(ON)}$ • RoHS and Halogen-Free Compliant Applications • Load switch • PWM	General Features $V_{DS} = 30V$ $I_D = 120A$ $R_{DS(ON)} = 2.8m\Omega$ (Typ.) @ $V_{GS} = 10V$ 100% UIS Tested 100% R_g Tested			
 Marking: 120N03 D:TO-252-3L  				
Absolute Maximum Ratings ($T_c = 25^{\circ}C$ Unless Otherwise Noted)				
Symbol	Parameter	Rating	Units	
V_{DS}	Drain-Source Voltage	30	V	
V_{GS}	Gate-Source Voltage	± 20	V	
$I_D@T_c=25^{\circ}C$	Continuous Drain Current, $V_{GS} @ 10V$	120	A	
$I_D@T_c=100^{\circ}C$	Continuous Drain Current, $V_{GS} @ 10V$	78	A	
I_{DM}	Pulsed Drain Current	444	A	
EAS	Single Pulse Avalanche Energy	315	mJ	
I_{AS}	Avalanche Current	53.8	A	
$P_D@T_c=25^{\circ}C$	Total Power Dissipation	62.5	W	
T_{STG}	Storage Temperature Range	-55 to 175	$^{\circ}C$	
T_J	Operating Junction Temperature Range	-55 to 175	$^{\circ}C$	
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 ($T_J=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V, V _{GS} =0V T _J =85°C	-	-	1 30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	0.9	1.2	1.5	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^d	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =20A T _J =125°C	-	2.8 4.4	3.8 -	mΩ
		V _{GS} =4.5V, I _{DS} =15A	-	4.0	5.5	
Gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =10A	-	24.6	-	S
Diode Characteristics						
V _{SD} ^d	Diode Forward Voltage	I _{SD} =20A, V _{GS} =0V	-	0.8	1.1	V
t _{rr}	Reverse Recovery Time	I _{DS} =20A, dI _{SD} /dt=100A/μs	-	35.6	-	ns
t _a	Charge Time		-	19.3	-	
t _b	Discharge Time		-	16.3	-	
Q _{rr}	Reverse Recovery Charge		-	26	-	nC
Dynamic Characteristics ^e						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	1	2	Ω
C _{iss}	Input Capacitance	V _{GS} =0V,	-	2285	2971	pF
C _{oss}	Output Capacitance	V _{DS} =15V,	-	850	-	
C _{rss}	Reverse Transfer Capacitance	Frequency=1.0MHz	-	85	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =15V, R _L =15Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	12.4	23	ns
t _r	Turn-on Rise Time		-	9.5	18	
t _{d(OFF)}	Turn-off Delay Time		-	27.2	49	
t _f	Turn-off Fall Time		-	35.2	64	
Gate Charge Characteristics ^e						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _{DS} =20A	-	20.6	28.8	nC
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =4.5V, I _{DS} =20A	-	9.8	-	
Q _{gth}	Threshold Gate Charge		-	1.8	-	
Q _{gs}	Gate-Source Charge		-	3.8	-	
Q _{gd}	Gate-Drain Charge		-	3.7	-	

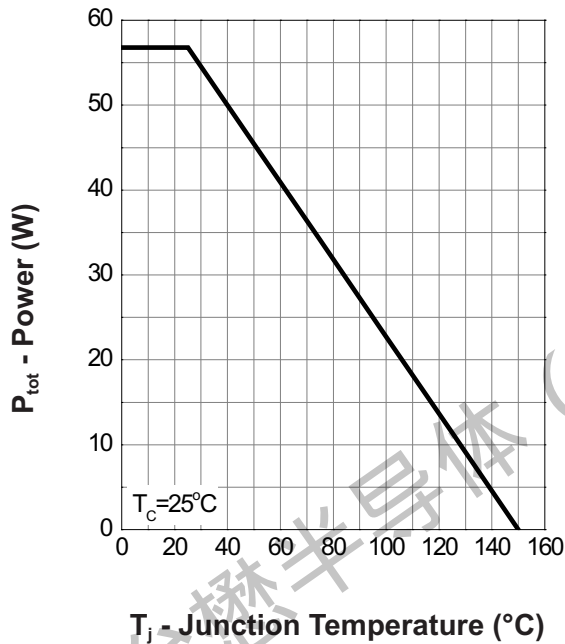


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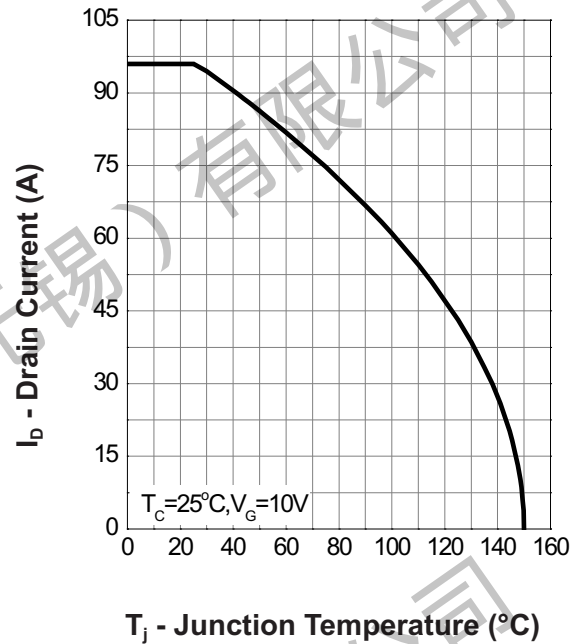
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Typical Operating Characteristics

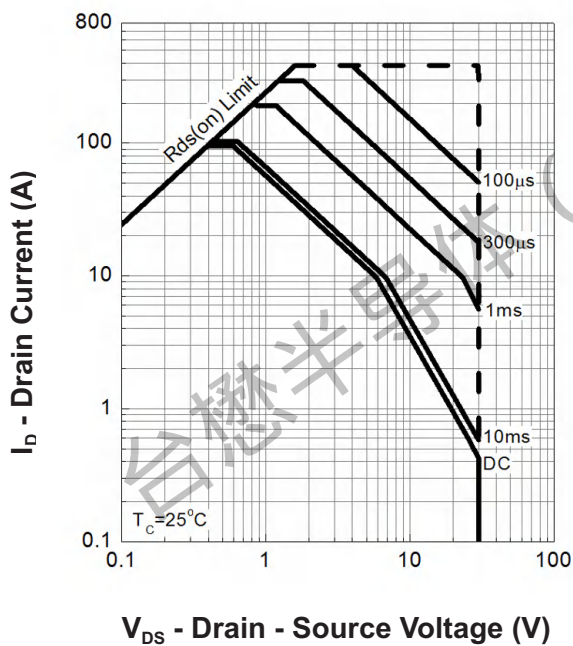
Power Dissipation



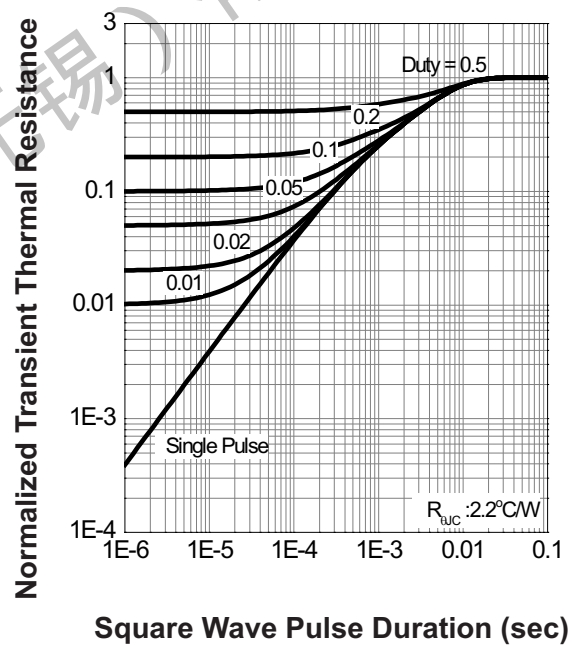
Drain Current



Safe Operation Area



Thermal Transient Impedance

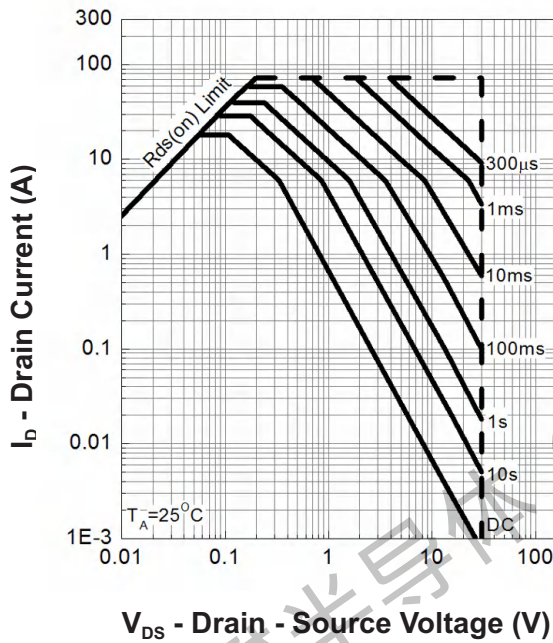




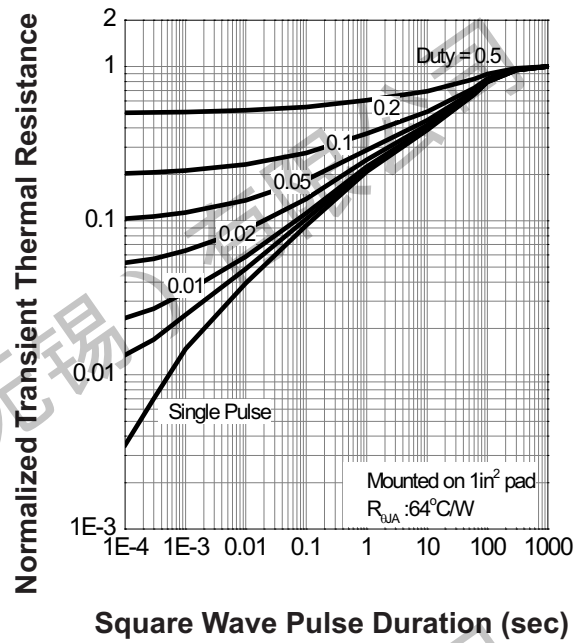
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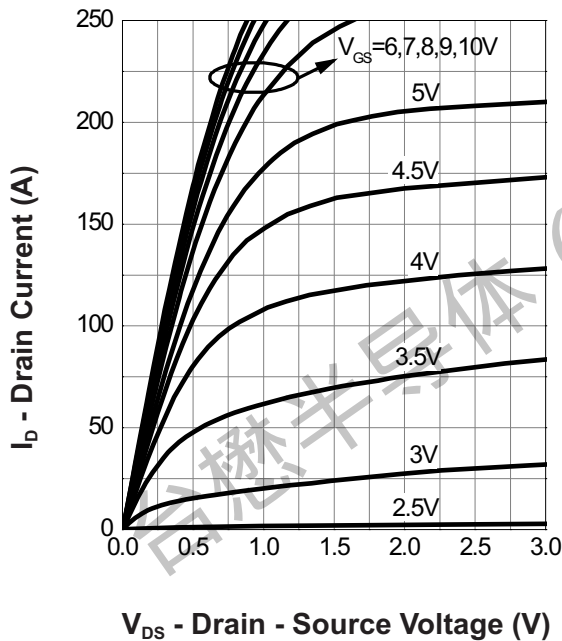
Safe Operation Area



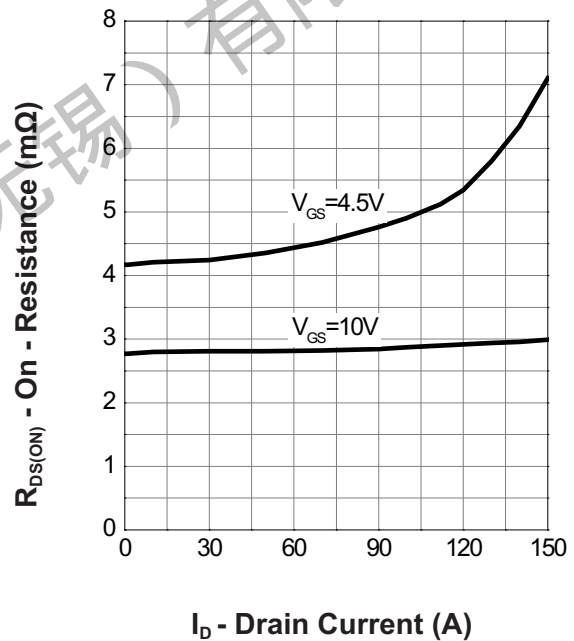
Thermal Transient Impedance



Output Characteristics



Drain-Source On Resistance

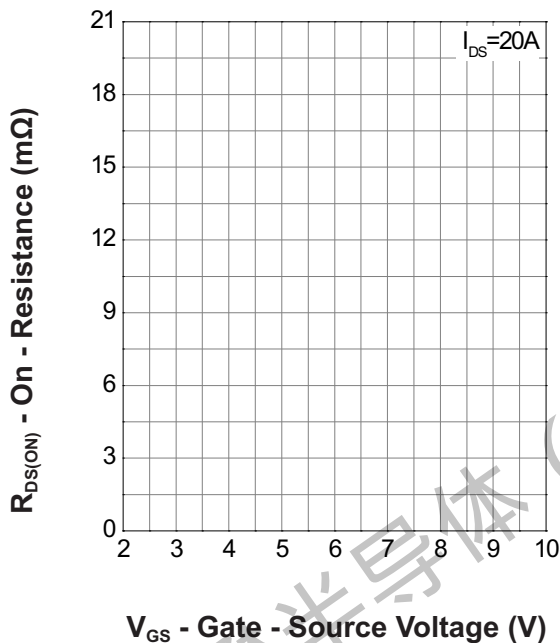




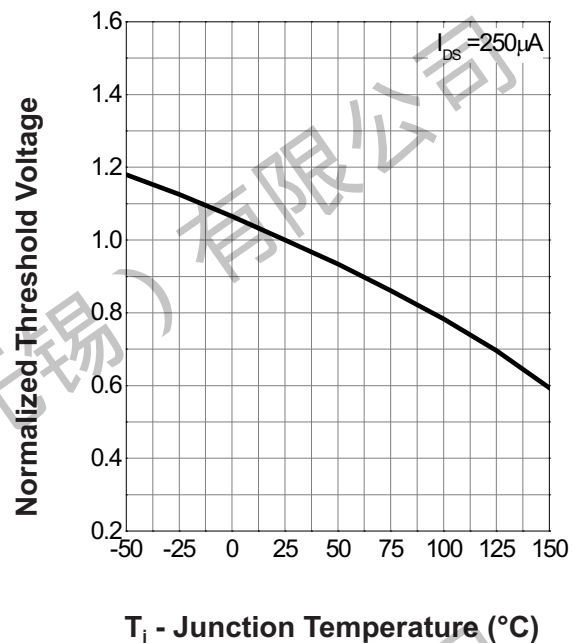
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Gate-Source On Resistance



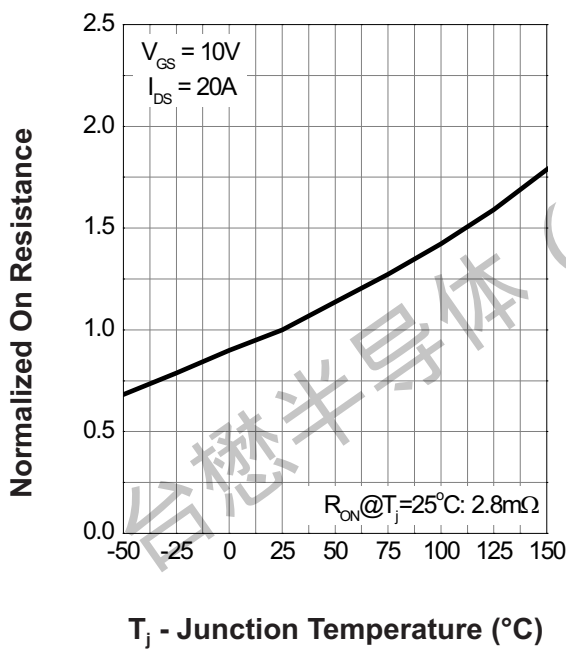
Gate Threshold Voltage



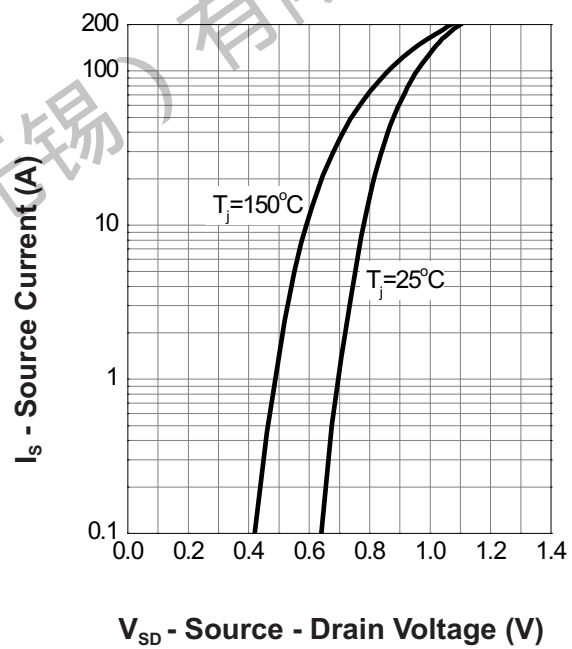
V_{GS} - Gate - Source Voltage (V)

T_j - Junction Temperature ($^{\circ}C$)

Drain-Source On Resistance



Source-Drain Diode Forward



T_j - Junction Temperature ($^{\circ}C$)

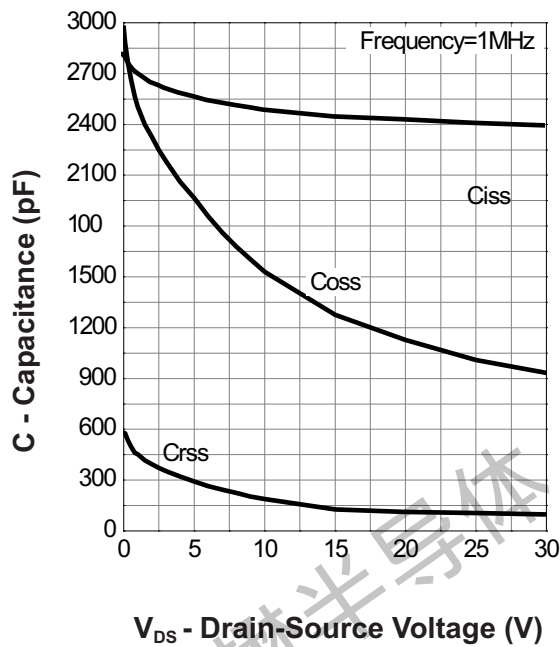
V_{SD} - Source - Drain Voltage (V)



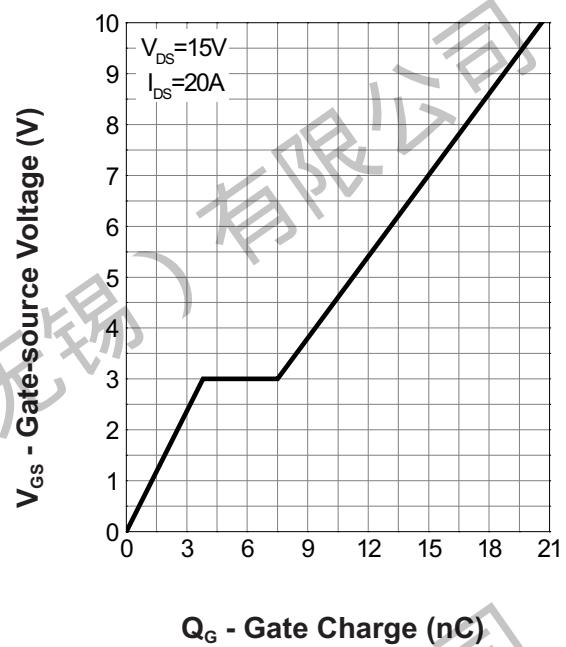
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Capacitance



Gate Charge

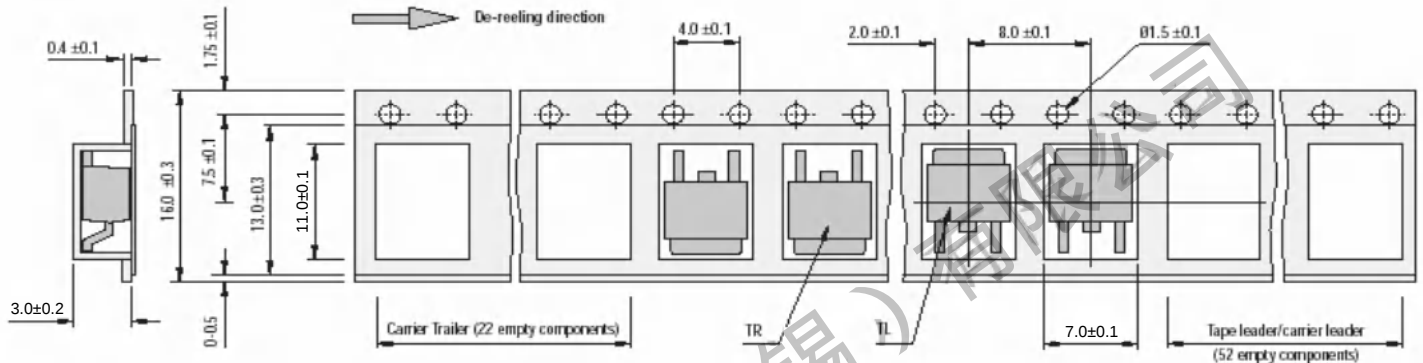




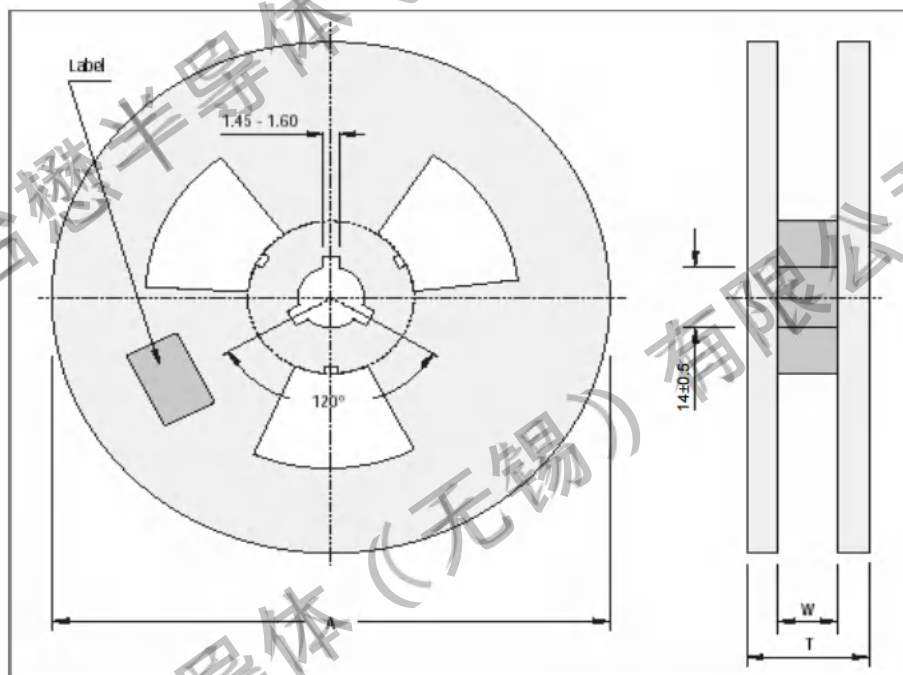
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N-Channel Enhancement Mosfet

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
2023.05.01	23.05	Original	