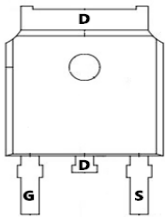
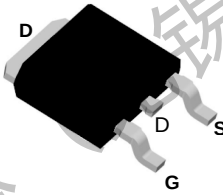
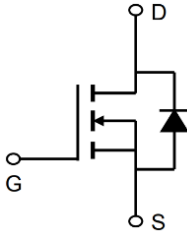


TM80N03D

N-Channel Enhancement Mosfet

General Description • Low $R_{DS(ON)}$ • RoHS and Halogen-Free Compliant Applications • Load switch • PWM	General Features $V_{DS} = 30V$ $I_D = 80A$ $R_{DS(ON)} = 5.0m\Omega (typ.) @ V_{GS} = 10V$ 100% UIS Tested 100% R_g Tested 																																																											
 Marking: 80N03 D:TO-252-3L  																																																												
Absolute Maximum Ratings $(T_c = 25^{\circ}C$ Unless Otherwise Noted) <table><tr><th>Symbol</th><th>Parameter</th><th>Rating</th><th>Units</th></tr><tr><td>V_{DS}</td><td>Drain-Source Voltage</td><td>30</td><td>V</td></tr><tr><td>V_{GS}</td><td>Gate-Source Voltage</td><td>± 20</td><td>V</td></tr><tr><td>$I_D@T_c=25^{\circ}C$</td><td>Continuous Drain Current, $V_{GS} @ 10V^1$</td><td>80</td><td>A</td></tr><tr><td>$I_D@T_c=100^{\circ}C$</td><td>Continuous Drain Current, $V_{GS} @ 10V^1$</td><td>50</td><td>A</td></tr><tr><td>I_{DM}</td><td>Pulsed Drain Current²</td><td>245</td><td>A</td></tr><tr><td>EAS</td><td>Single Pulse Avalanche Energy³</td><td>306</td><td>mJ</td></tr><tr><td>I_{AS}</td><td>Avalanche Current</td><td>53.8</td><td>A</td></tr><tr><td>$P_D@T_c=25^{\circ}C$</td><td>Total Power Dissipation³</td><td>82.5</td><td>W</td></tr><tr><td>T_{STG}</td><td>Storage Temperature Range</td><td>-55 to 175</td><td>$^{\circ}C$</td></tr><tr><td>T_J</td><td>Operating Junction Temperature Range</td><td>-55 to 175</td><td>$^{\circ}C$</td></tr></table> Thermal Data <table><tr><th>Symbol</th><th>Parameter</th><th>Typ.</th><th>Max.</th><th>Unit</th></tr><tr><td>$R_{\theta JA}$</td><td>Thermal Resistance Junction-ambient ¹</td><td>---</td><td>62</td><td>$^{\circ}C/W$</td></tr><tr><td>$R_{\theta JC}$</td><td>Thermal Resistance Junction-Case¹</td><td>---</td><td>6.6</td><td>$^{\circ}C/W$</td></tr></table>		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, $V_{GS} @ 10V^1$	80	A	$I_D@T_c=100^{\circ}C$	Continuous Drain Current, $V_{GS} @ 10V^1$	50	A	I_{DM}	Pulsed Drain Current ²	245	A	EAS	Single Pulse Avalanche Energy ³	306	mJ	I_{AS}	Avalanche Current	53.8	A	$P_D@T_c=25^{\circ}C$	Total Power Dissipation ³	82.5	W	T_{STG}	Storage Temperature Range	-55 to 175	$^{\circ}C$	T_J	Operating Junction Temperature Range	-55 to 175	$^{\circ}C$	Symbol	Parameter	Typ.	Max.	Unit	$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	---	62	$^{\circ}C/W$	$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	6.6	$^{\circ}C/W$
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Electrical Characteristics ($T_c=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.5	3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=30A$	-	5.0	6.9	m Ω
		$V_{GS}=5V, I_D=24A$	-	7.0	10	
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=24A$	20	-	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V,$ $F=1.0MHz$	-	1716	-	PF
Output Capacitance	C_{oss}		-	251	-	PF
Reverse Transfer Capacitance	C_{rss}		-	230	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=10V, I_D=30A$ $V_{GS}=10V, R_{GEN}=2.7\Omega$	-	20	-	nS
Turn-on Rise Time	t_r		-	15	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	60	-	nS
Turn-Off Fall Time	t_f		-	10	-	nS
Total Gate Charge	Q_g	$V_{DS}=10V, I_D=30A,$ $V_{GS}=10V$	-	60.5	-	nC
Gate-Source Charge	Q_{gs}		-	8.1	-	nC
Gate-Drain Charge	Q_{gd}		-	7.8	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V, I_S=24A$	-	-	1.2	V
Diode Forward Current (Note 2)	I_S		-	-	80	A
Reverse Recovery Time	t_{rr}	$T_J = 25^{\circ}C, I_F = 80A$ $di/dt = 100A/\mu s$ (Note3)	-	32	50	nS
Reverse Recovery Charge	Q_{rr}		-	12	20	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production
5. EAS condition: $T_J=25^{\circ}\text{C}, V_{DD}=15V, V_G=10V, L=0.5mH, R_g=25\Omega, I_{AS}=35A$

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Typical Performance Characteristics

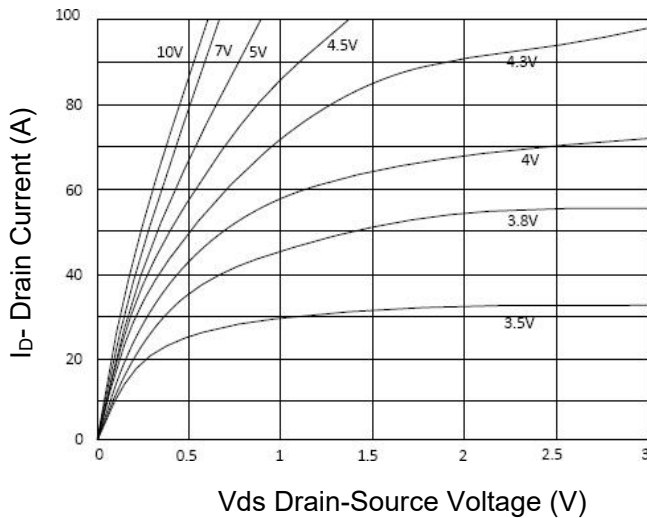


Figure 1 Output Characteristics

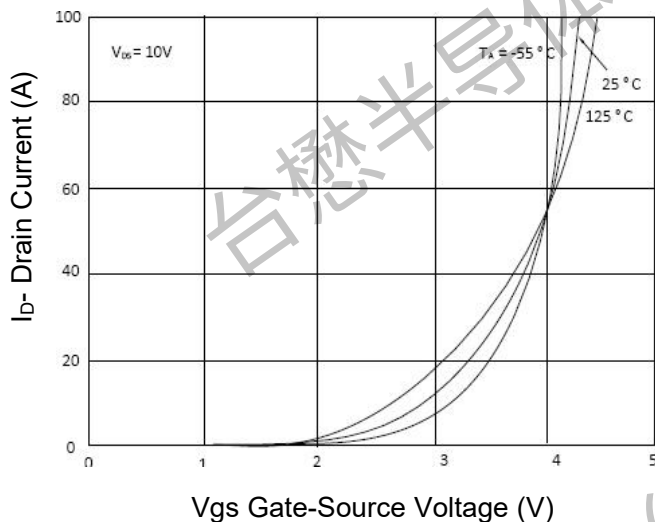


Figure 2 Transfer Characteristics

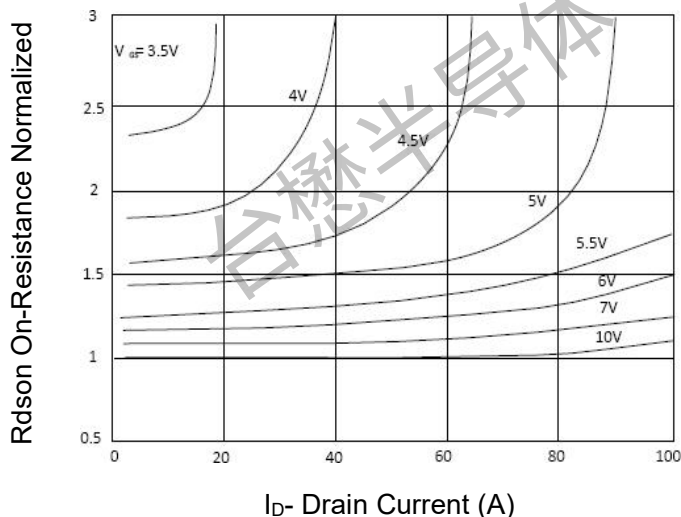


Figure 3 $R_{DS(on)}$ - Drain Current

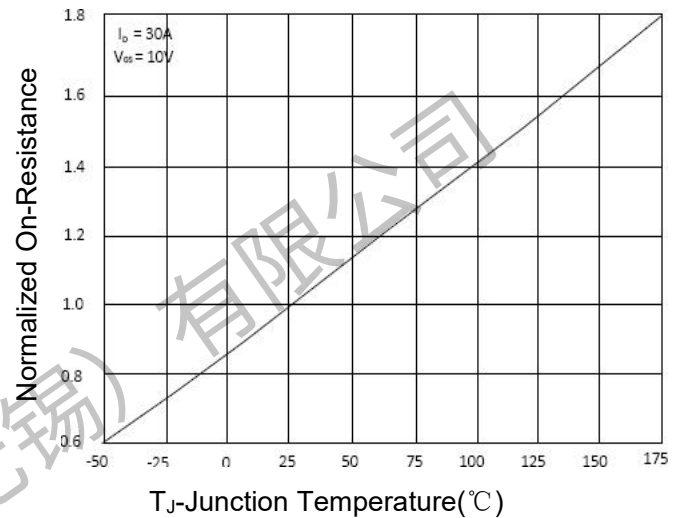


Figure 4 $R_{DS(on)}$ -Junction Temperature

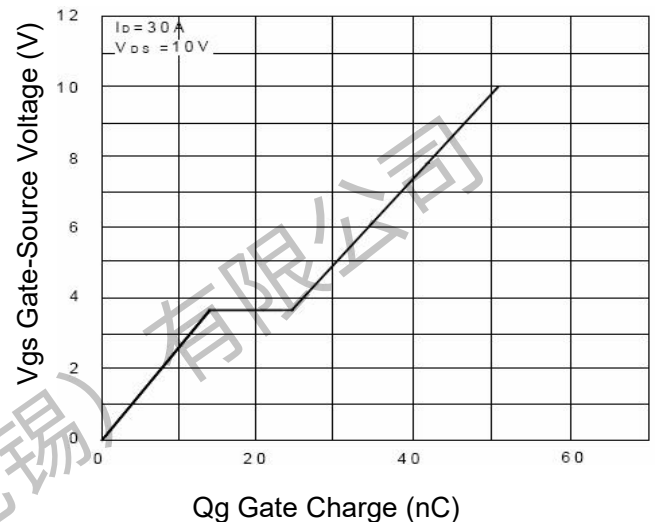


Figure 5 Gate Charge

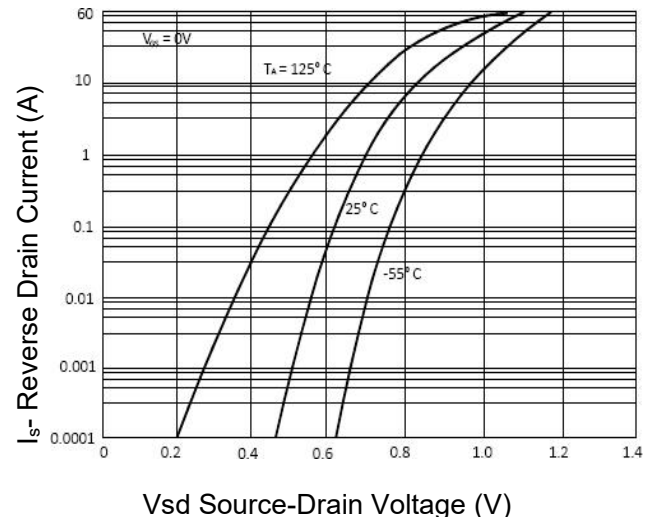


Figure 6 Source- Drain Diode Forward



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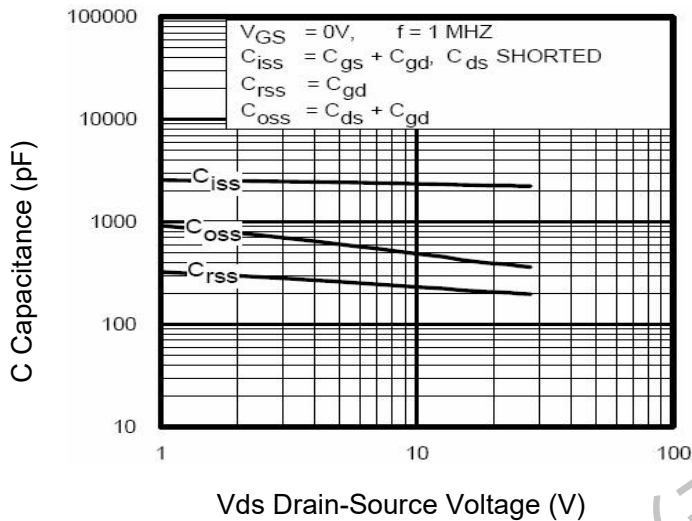


Figure 7 Capacitance vs V_{DS}

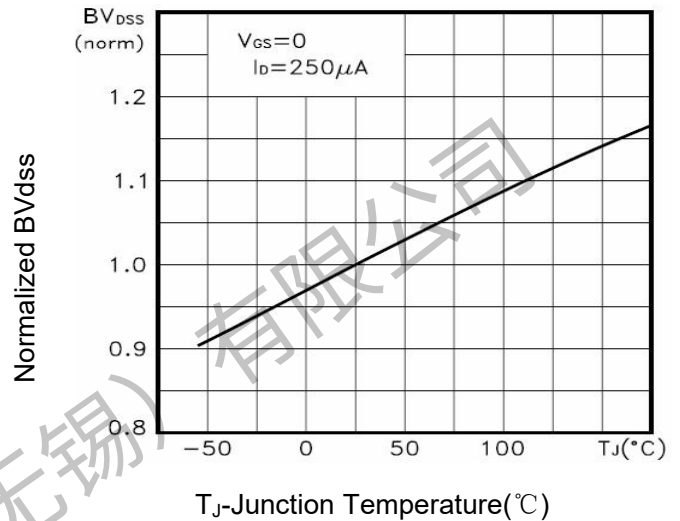


Figure 9 BV_{DSS} vs Junction Temperature

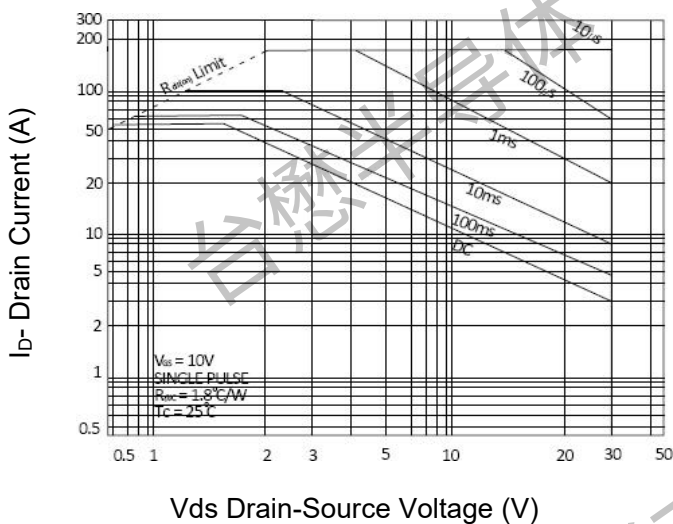


Figure 8 Safe Operation Area

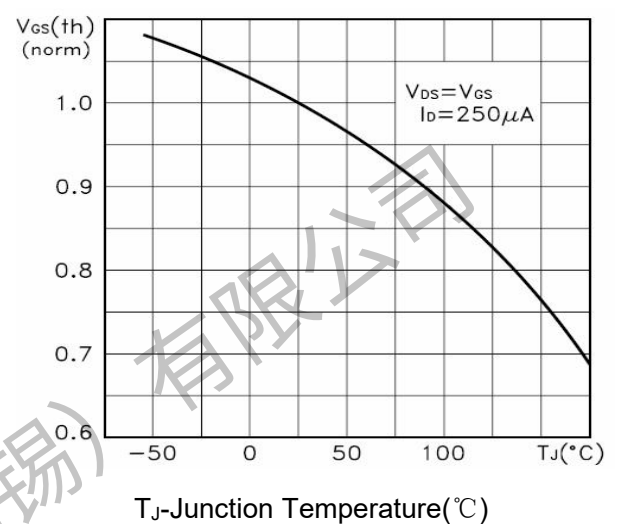


Figure 10 $V_{GS(th)}$ vs Junction Temperature

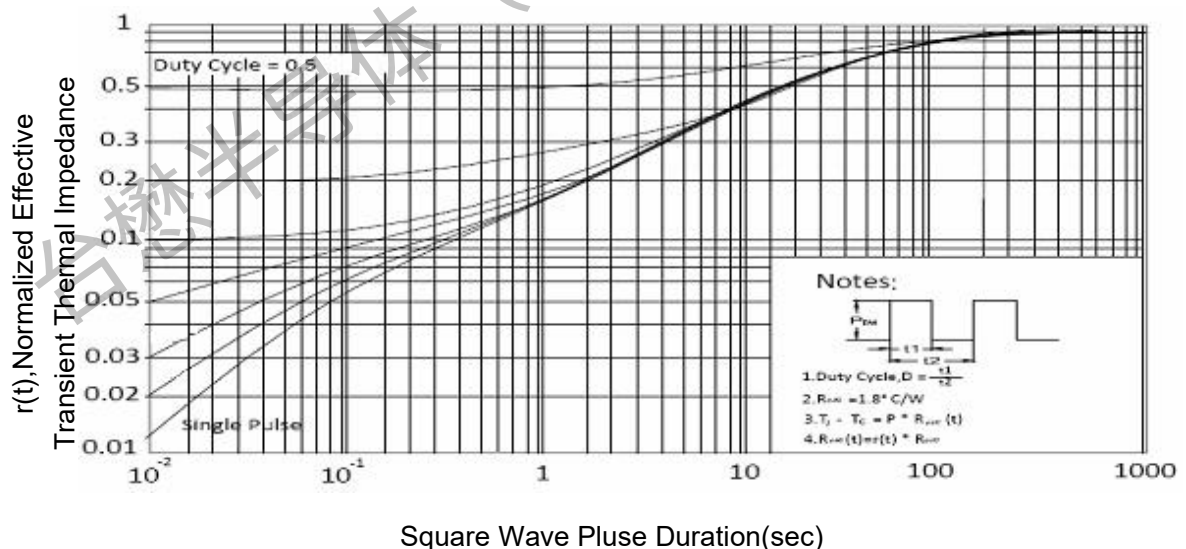
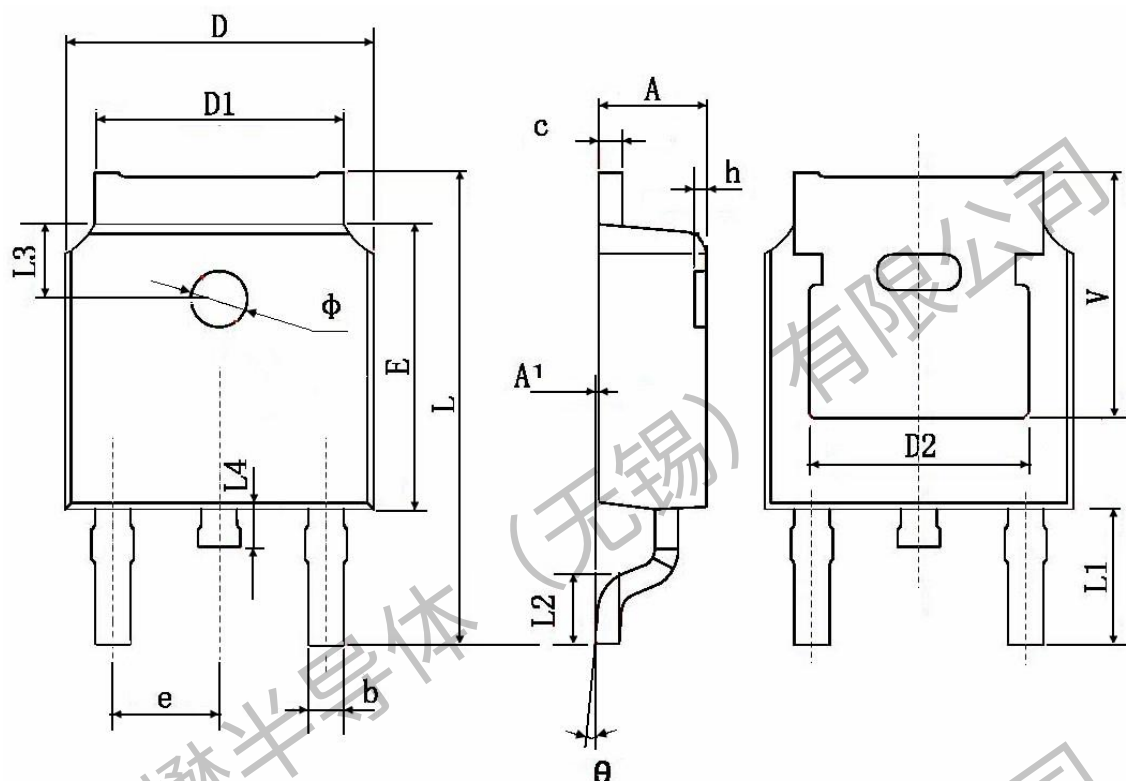


Figure 11 Normalized Maximum Transient Thermal Impedance

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Package Mechanical Data: TO-252-3L

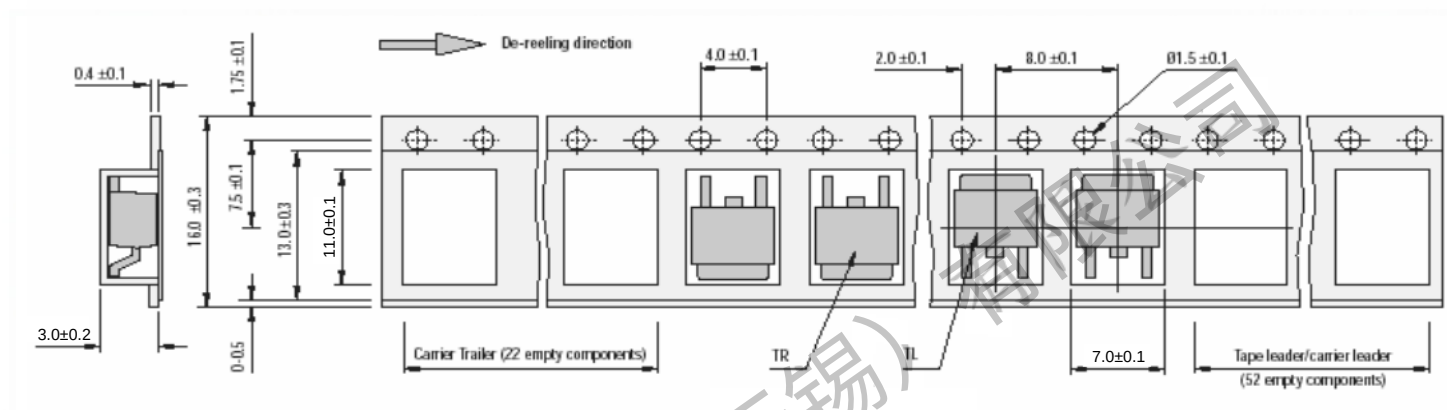


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	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.	

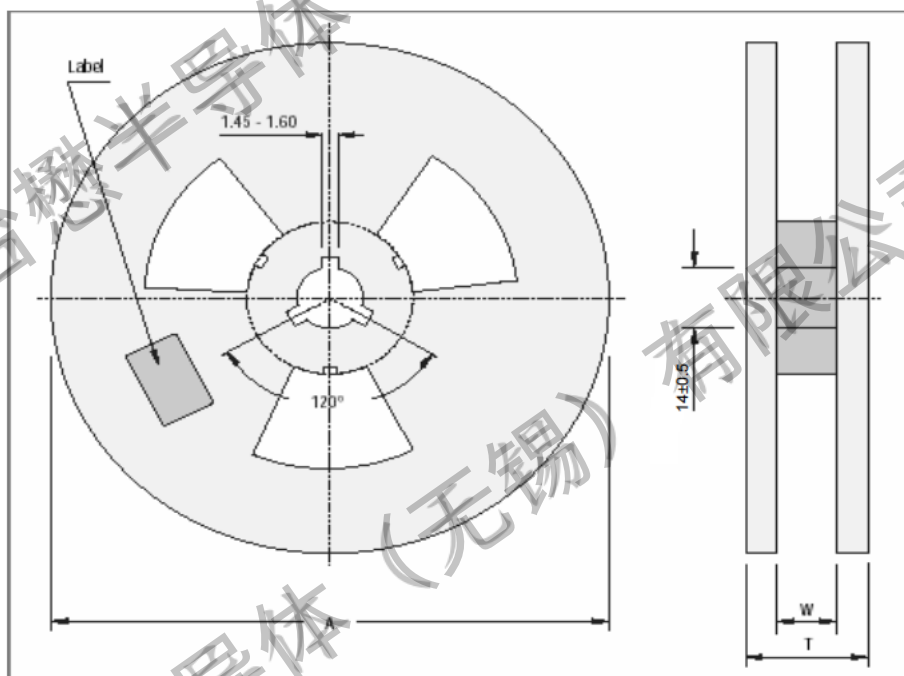
TM80N03D

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
2023.05.09	23.05	Original	