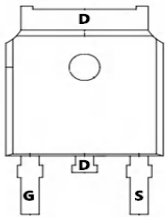
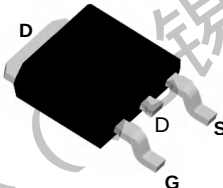
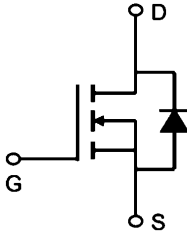


TM80N03D

N-Channel Enhancement Mosfet

General Description • Low $R_{DS(ON)}$ • RoHS and Halogen-Free Compliant Applications • Load switch • PWM	General Features $V_{DS} = 30V$ $I_D = 80A$ $R_{DS(ON)} = 4.2m\Omega (typ.) @ V_{GS} = 10V$ 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>		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	$^{\circ}C$
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Electrical Characteristics (T_C=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =250μA	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} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.9	1.2	1.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =30A	-	4.2	4.9	mΩ
		V _{GS} =4.5V, I _D = 24A	-	5.8	6.5	
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} =2.7Ω	-	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°C, IF = 80A di/dt = 100A/μs(Notes3)	-	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 ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition: T_J=25°C, V_{DD}=15V, V_G=10V, L=0.5mH, R_g=25Ω, I_{AS}=35A

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Typical Performance Characteristics

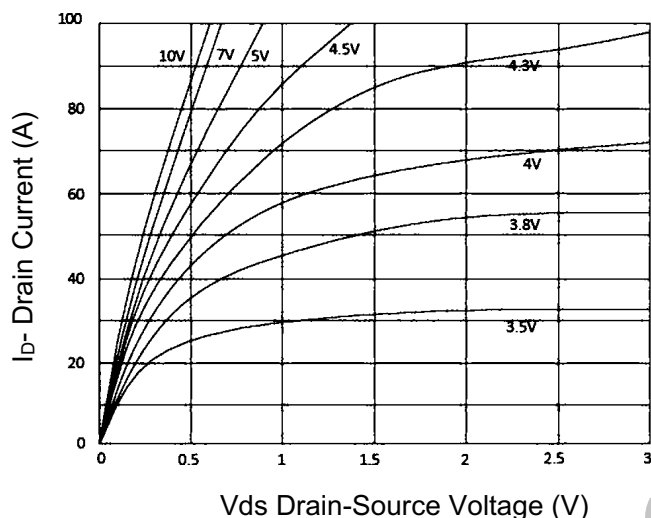


Figure 1 Output Characteristics

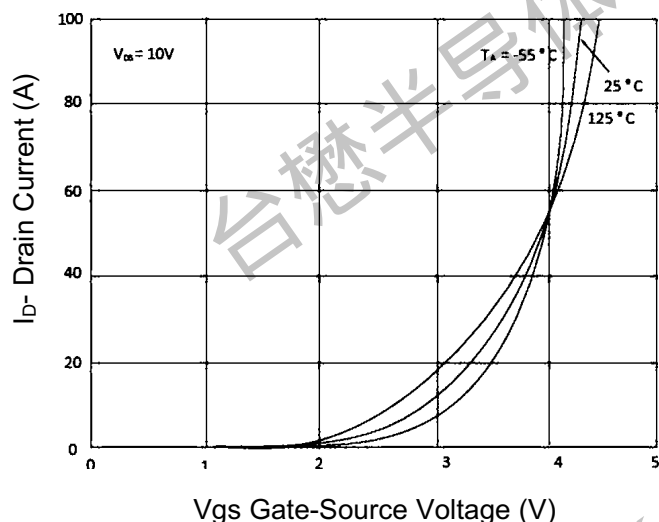


Figure 2 Transfer Characteristics

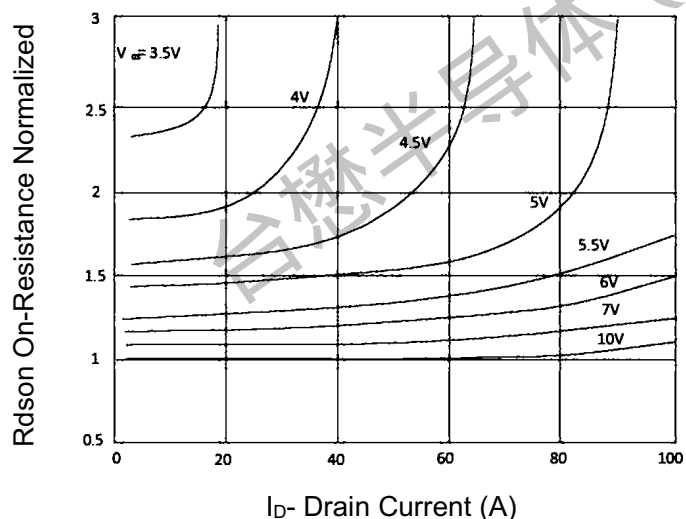


Figure 3 Rdson- Drain Current

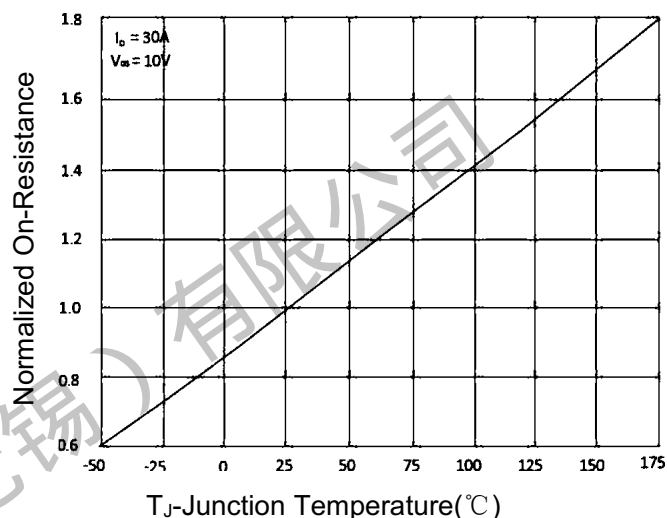


Figure 4 Rdson-Junction Temperature

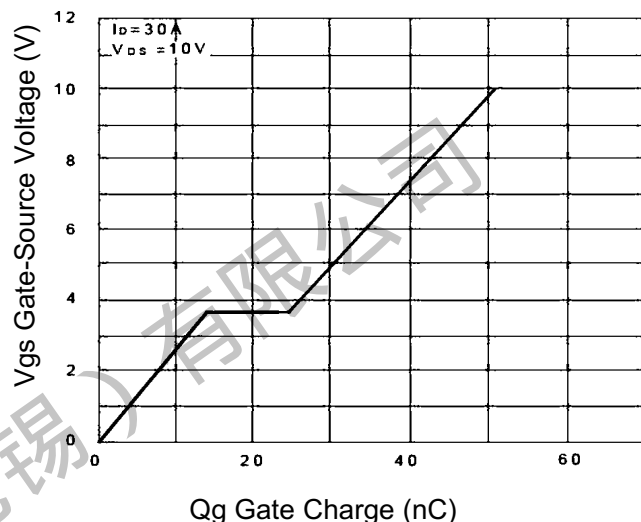


Figure 5 Gate Charge

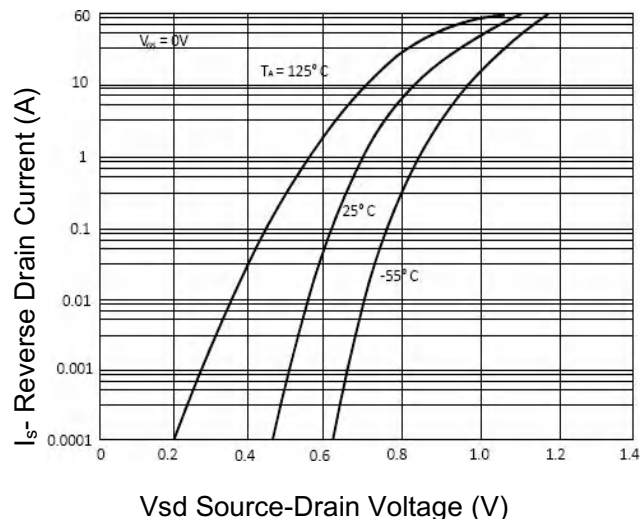


Figure 6 Source- Drain Diode Forward



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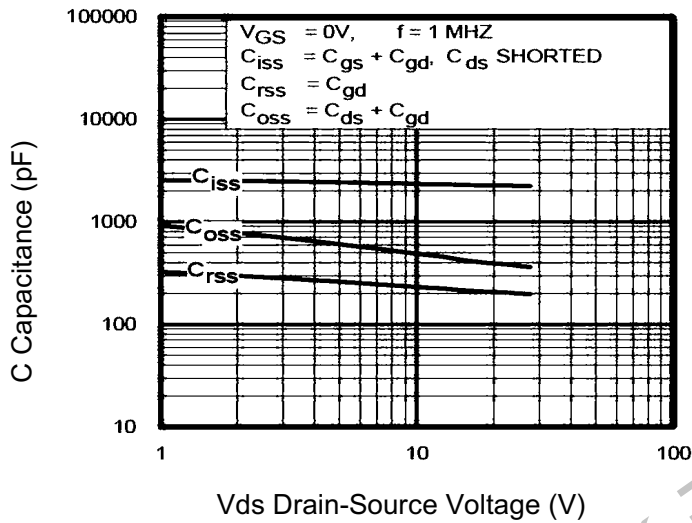


Figure 7 Capacitance vs Vds

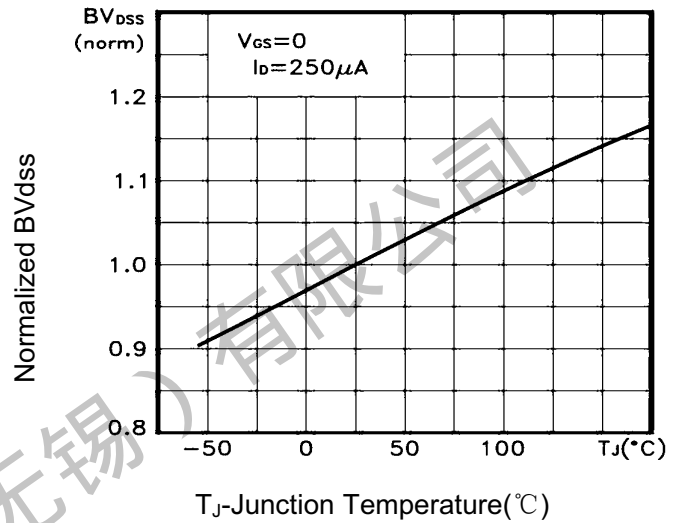


Figure 9 BV_{DSS} vs Junction Temperature

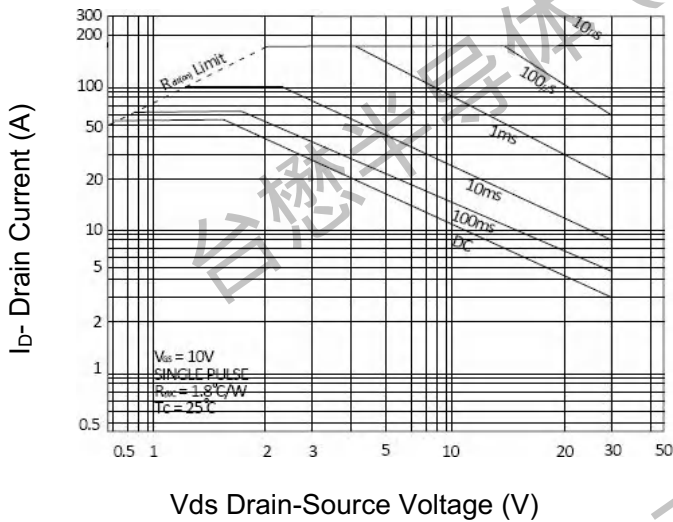


Figure 8 Safe Operation Area

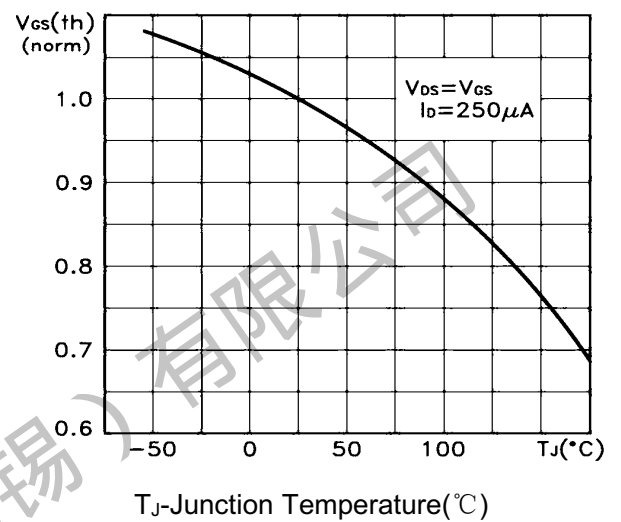


Figure 10 V_{GS(th)} vs Junction Temperature

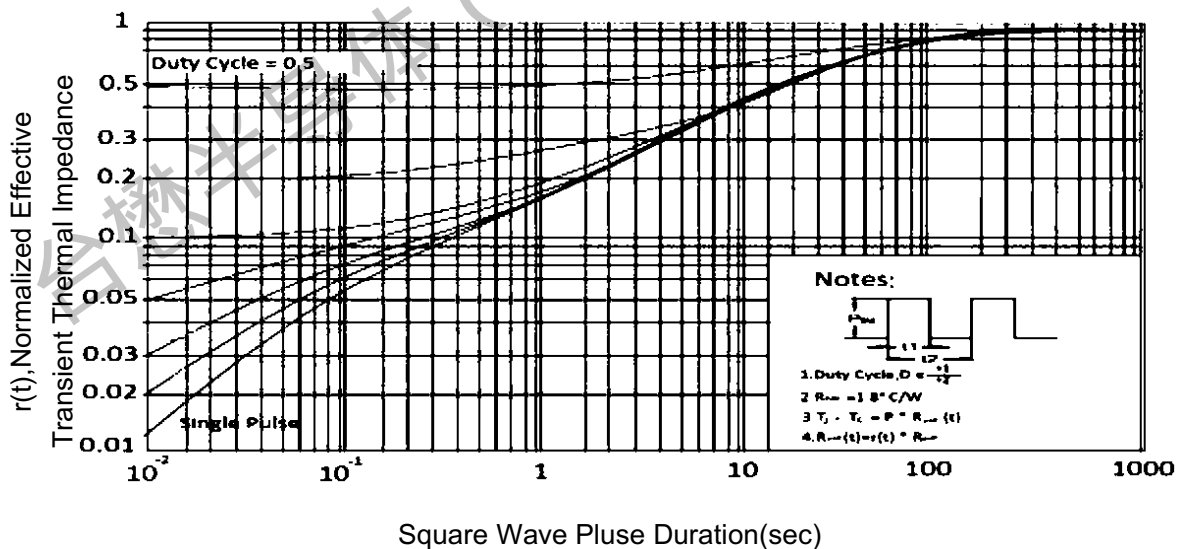
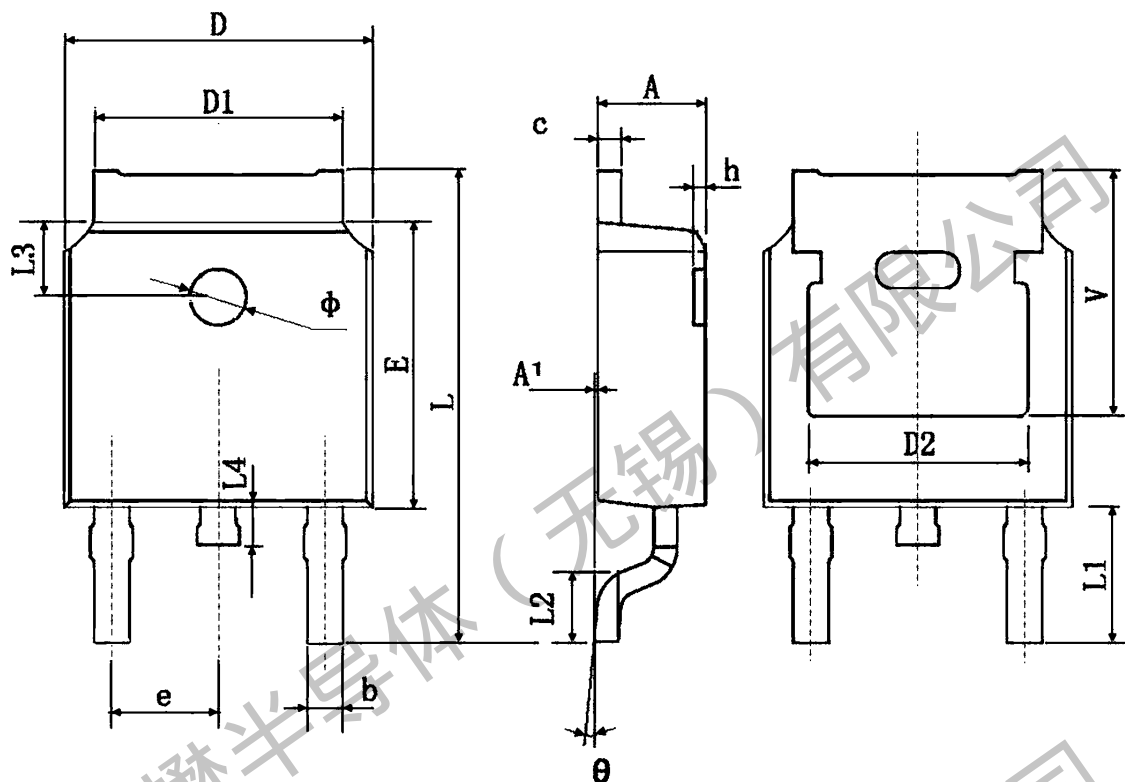


Figure 11 Normalized Maximum Transient Thermal Impedance

N-Channel Enhancement Mosfet

Package Mechanical Data: TO-252-3L

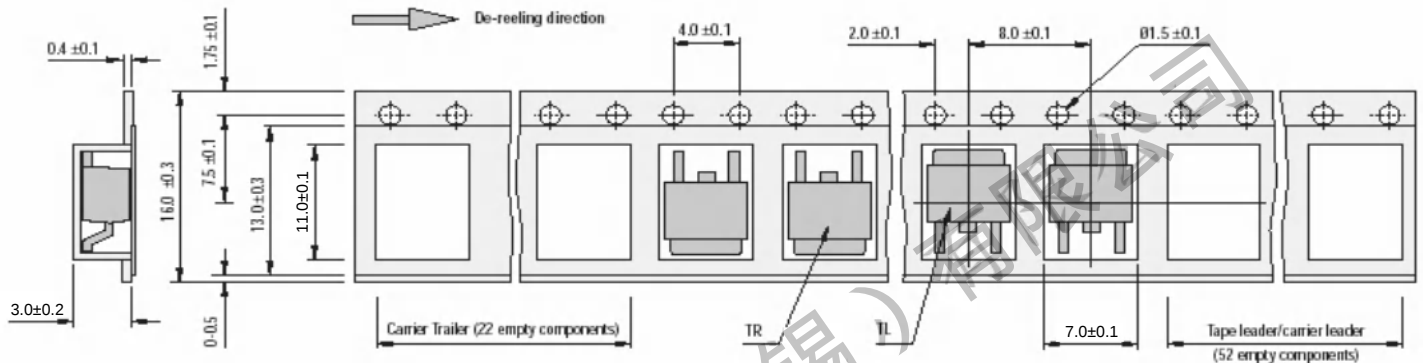


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386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

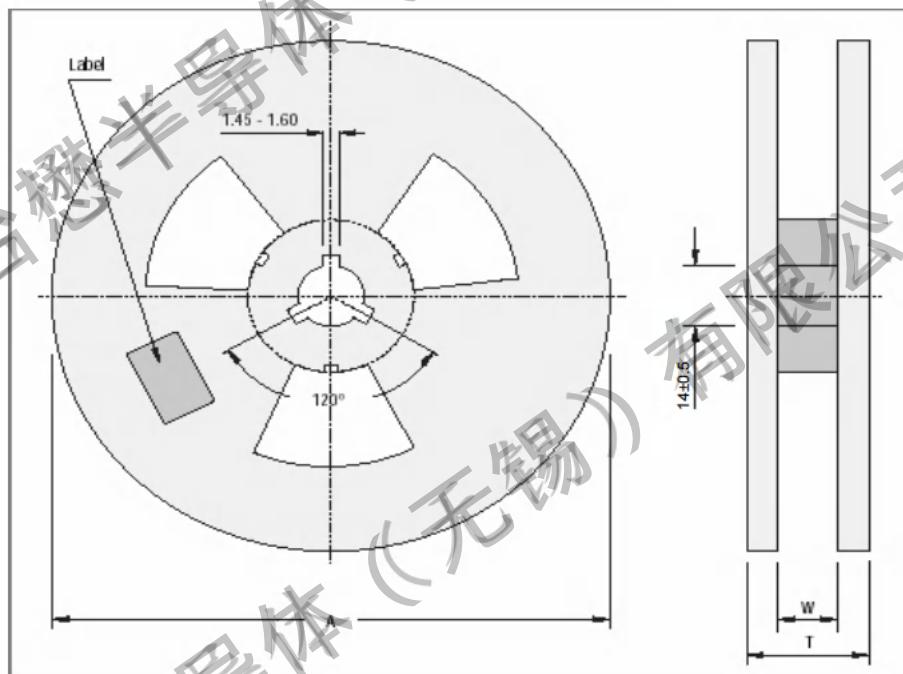
TM80N03D

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
2023.08.09	23.08	Original	