

TM80N03NF

N-Channel Enhancement Mosfet

General Description

- Low $R_{DS(ON)}$
- RoHS and Halogen-Free Compliant

Applications

- Load switch
- PWM

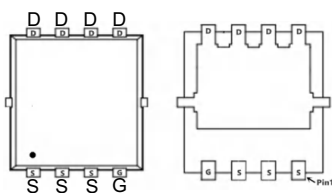
General Features

$V_{DS} = 30V$ $I_D = 80A$

$R_{DS(ON)} = 4.2m\Omega$ (typ.) @ $V_{GS} = 10V$

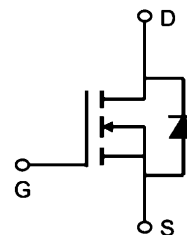
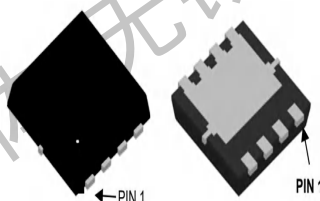
100% UIS Tested

100% R_g Tested



Marking: 80N03

NF:DFN5x6-8L



Absolute Maximum Ratings ($T_A = 25^\circ C$ 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, $V_{GS} @ 10V$	80	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	52	A
I_{DM}	Pulsed Drain Current ¹	296	A
EAS	Single Pulse Avalanche Energy ⁵	150	mJ
P_D	Total Power Dissipation	65	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 ²	---	3.6	$^\circ C/W$

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Electrical Characteristics (TC=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	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	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.9	1.2	1.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$	-	4.2	5.9	m Ω
		$V_{GS}=4.5V, I_D=20A$	-	6.0	8.9	
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=20A$	20	-	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{ISS}	$V_{DS}=15V, V_{GS}=0V,$ $F=1.0MHz$	-	1400	-	PF
Output Capacitance	C_{OSS}		-	205	-	PF
Reverse Transfer Capacitance	C_{RSS}		-	177	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=15V, I_D=20A$ $V_{GS}=10V, R_{GEN}=6\Omega$	-	9	-	nS
Turn-on Rise Time	t_r		-	8	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	28	-	nS
Turn-Off Fall Time	t_f		-	5	-	nS
Total Gate Charge	Q_g	$V_{DS}=15V, I_D=20A,$ $V_{GS}=10V$	-	32.3	-	nC
Gate-Source Charge	Q_{gs}		-	4.9	-	nC
Gate-Drain Charge	Q_{gd}		-	6.9	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V, I_S=20A$	-	0.85	1.2	V
Diode Forward Current (Note 2)	I_S		-	-	80	A
Reverse Recovery Time	t_{rr}	$T_J = 25^{\circ}C, I_F = 20A$	-	-	27	nS
Reverse Recovery Charge	Q_{rr}	$di/dt = 100A/\mu s$ (Note3)	-	-	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: $T_J=25^\circ C, V_{DD}=15V, V_G=10V, L=0.5mH, R_g=25\Omega$

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Typical Electrical and Thermal Characteristics (Curves)

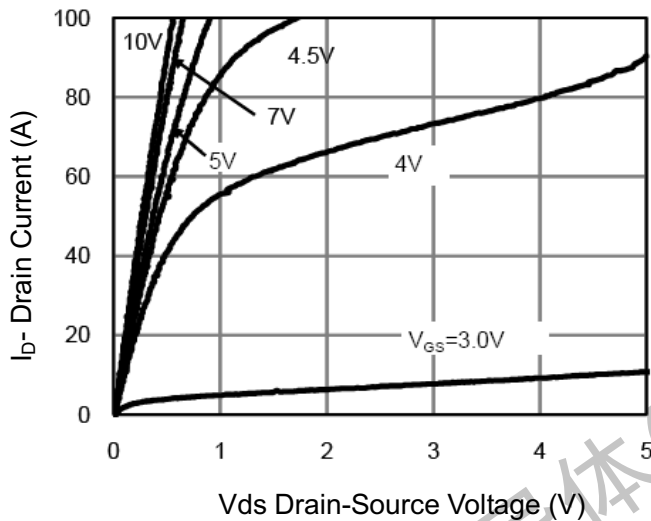


Figure 1 Output Characteristics

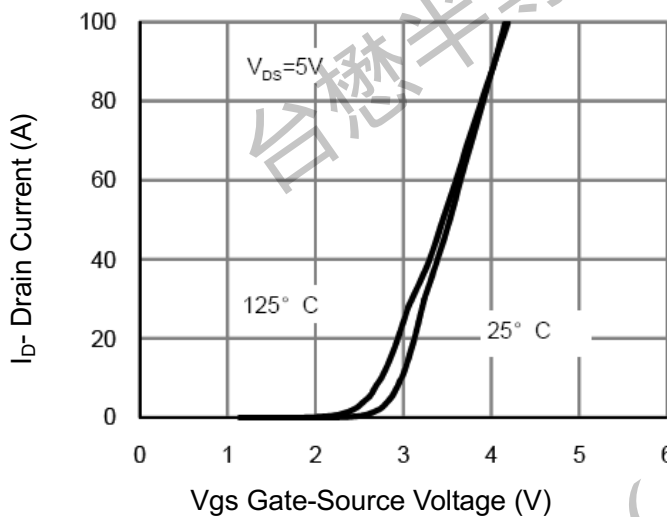


Figure 2 Transfer Characteristics

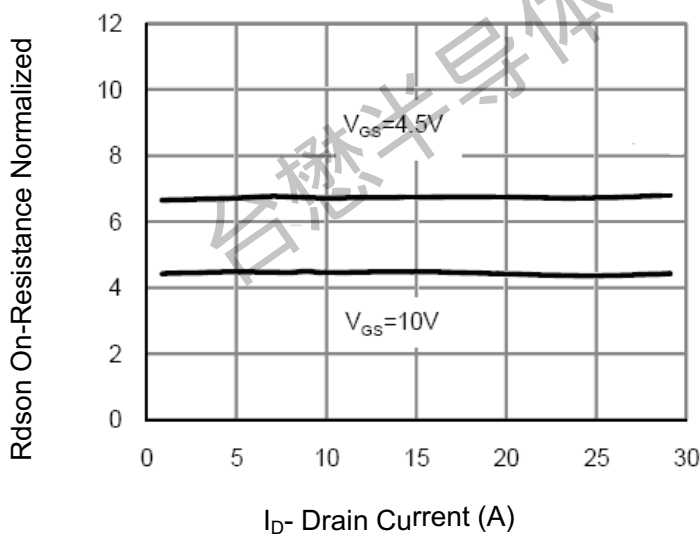


Figure 3 $R_{DS(on)}$ - Drain Current

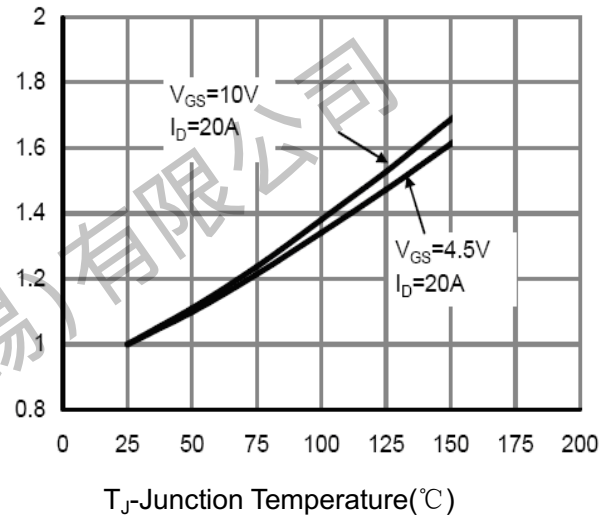


Figure 4 $R_{DS(on)}$ -Junction Temperature

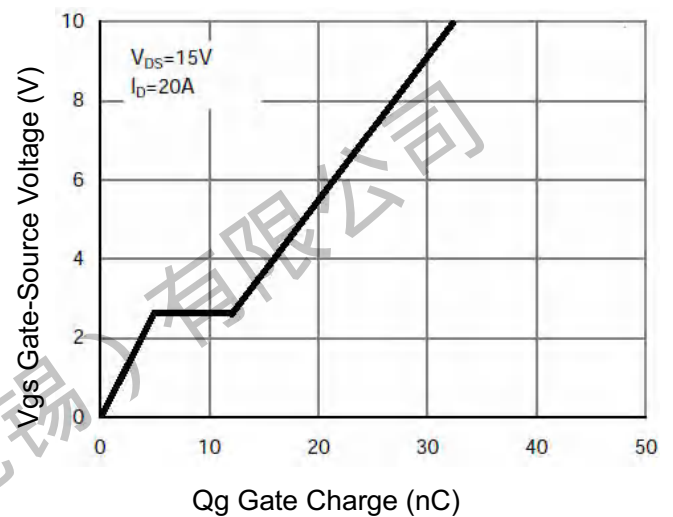


Figure 5 Gate Charge

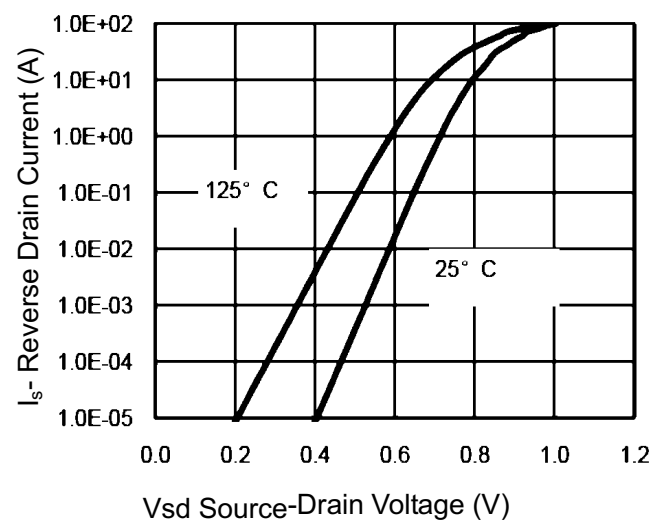


Figure 6 Source- Drain Diode Forward

TM80N03NF

N-Channel Enhancement Mosfet

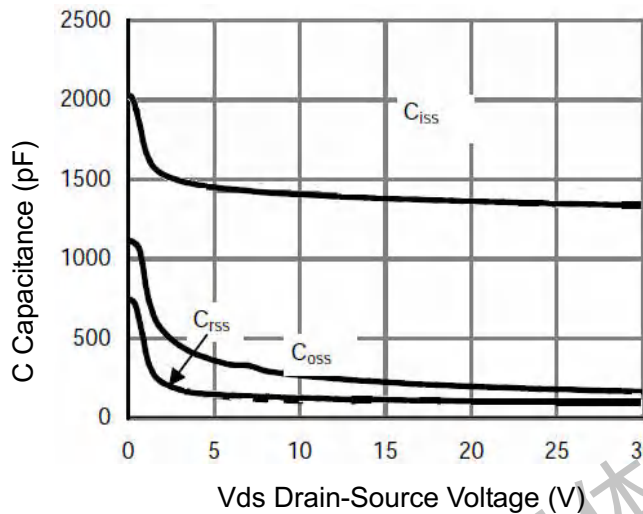


Figure 7 Capacitance vs Vds

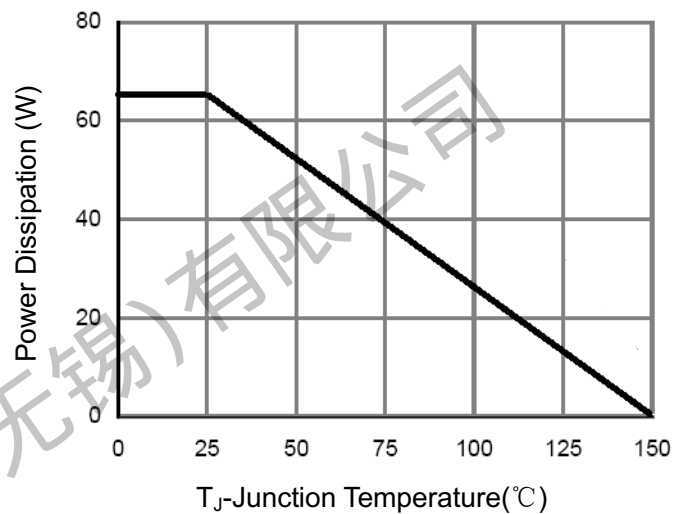


Figure 9 Power De-rating

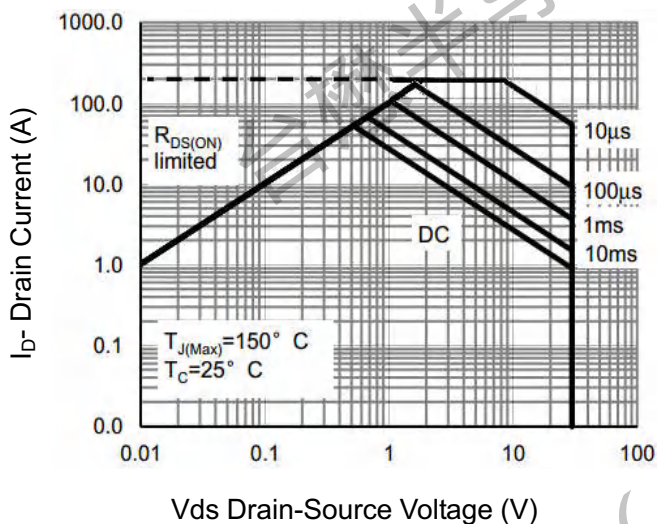


Figure 8 Safe Operation Area

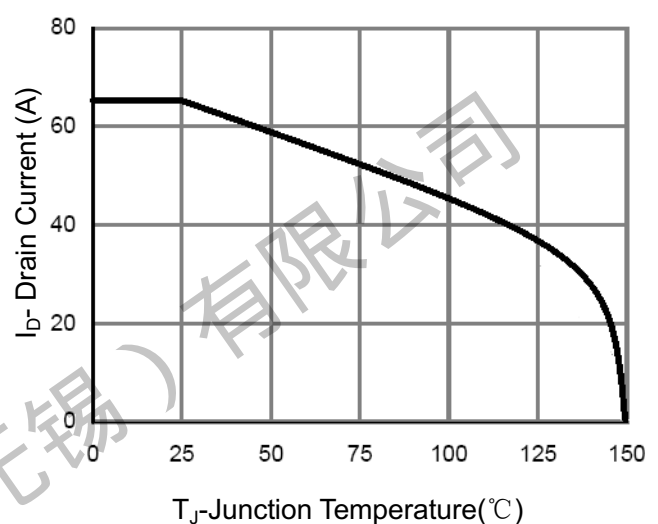


Figure 10 ID Current- Junction Temperature

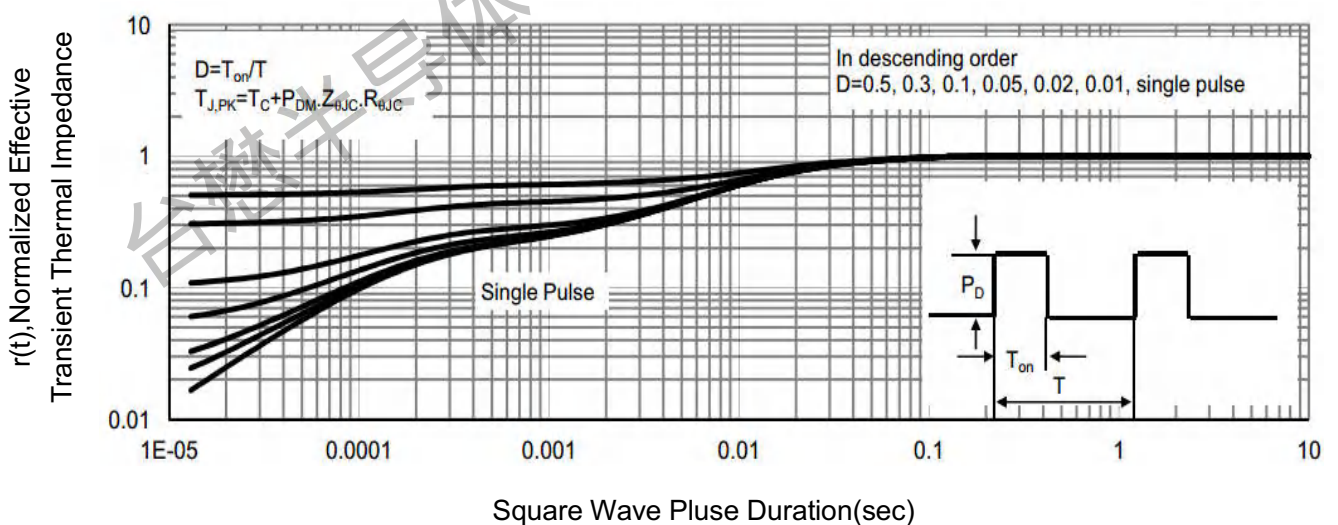
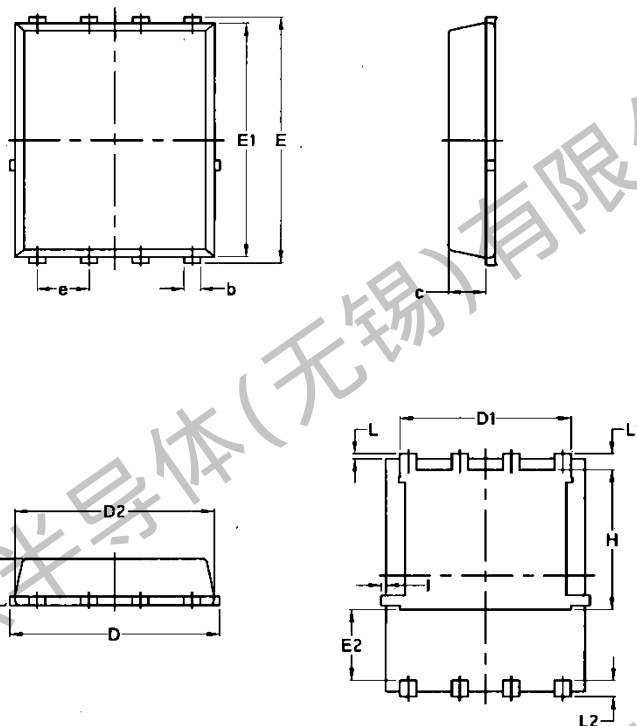


Figure 11 Normalized Maximum Transient Thermal Impedance

TM80N03NF

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Package Mechanical Data:DFN5x6-8L

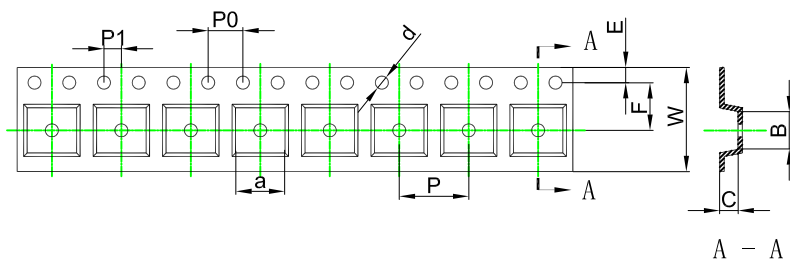


Symbol	Common			
	mm		Inch	
	Mim	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070

TM80N03NF

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PDFN5×6-8L Embossed Carrier Tape



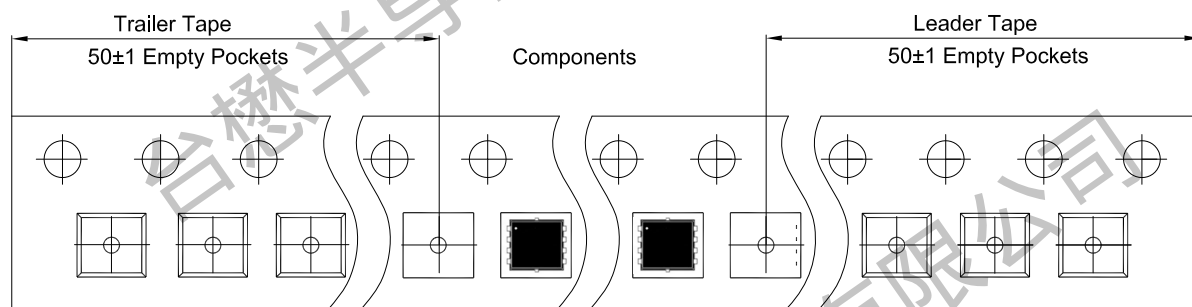
Packaging Description:

SOP-8L parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 2,500 units per 13" or 33cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

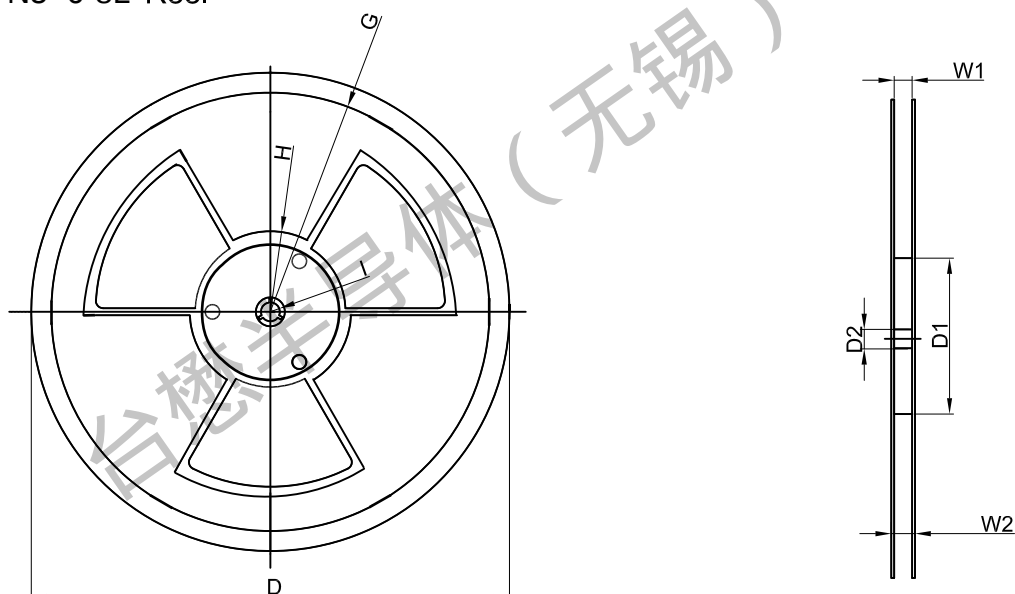
ALL DIM IN mm

Dimensions are in millimeter										
Pkg type	a	B	C	d	E	F	P0	P	P1	W
PDFN5×6-8L	6.40	5.40	2.10	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

PDFN5×6-8L Tape Leader and Trailer



PDFN5×6-8L Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
13"Dia	Ø330.00	100.00	13.00	R135.00	R55.00	R6.50	12.00	14.00

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
5,000 pcs	13 inch	10,000 pcs	370×355×52	50,000 pcs	400×360×368	

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Revision history:

Date	Rev	Description	Page
2023.05.19	23.05	Original	