
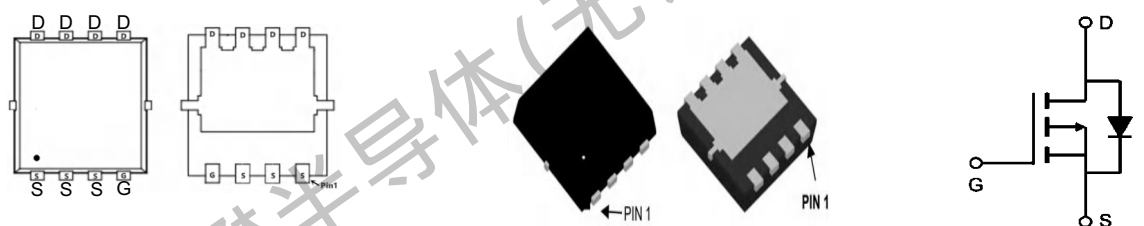


# TMG120P06NF

## P-Channel Enhancement Mosfet

<p><b>General Description</b></p> <ul style="list-style-type: none"> <li>• Low <math>R_{DS(ON)}</math></li> <li>• RoHS and Halogen-Free Compliant</li> </ul> <p><b>Applications</b></p> <ul style="list-style-type: none"> <li>• Load switch</li> <li>• PWM</li> </ul>	<p><b>General Features</b></p> <p><math>V_{DS} = -60V</math> <math>I_D = -120A</math></p> <p><math>R_{DS(ON)} = 5.5 m\Omega (typ.) @ V_{GS} = -10V</math></p> <p>100% UIS Tested 100% <math>R_g</math> Tested</p> 
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NF:DFN5x6-8L



Marking: G120P06

**Absolute Maximum Ratings** ( $T_C = 25^\circ C$  unless otherwise noted)

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	-60	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	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, $-V_{GS} @ -10V$	-65	A
$I_{DM}$	Pulsed Drain Current	-440	A
EAS	Single Pulse Avalanche Energy	960	mJ
$P_D$	Total Power Dissipation	180	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	---	60	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case	---	0.69	$^\circ C/W$

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Electrical Characteristics (T<sub>J</sub>= 25°C unless otherwise specified):

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-60	---	---	V
BV <sub>DSS</sub> /ΔT <sub>J</sub>	BV <sub>DSS</sub> Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =-1mA	---	---	---	V/°C
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =-10V, I <sub>D</sub> =-15A	---	5.5	7.2	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250uA	-1.0	-2.0	-3.0	V
ΔV <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient		---	---	---	mV/°C
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =-60V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	-1	uA
		V <sub>DS</sub> =-60, V <sub>GS</sub> =0V, T <sub>J</sub> =100°C	---	---	-100	
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	---	---	±100	nA
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =-10V, I <sub>D</sub> =-30A	---	---	---	S
R <sub>g</sub>	Gate Resistance	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz	---	2	---	Ω
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =-10V, V <sub>GS</sub> =-10V, I <sub>D</sub> =-15A	---	1.5	---	nC
Q <sub>gs</sub>	Gate-Source Charge		---	1.5	---	
Q <sub>gd</sub>	Gate-Drain Charge		---	1.5	---	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-30V, R <sub>G</sub> =3Ω, I <sub>D</sub> =-15A	---	4.5	---	ns
T <sub>r</sub>	Rise Time		---	2.5	---	
T <sub>d(off)</sub>	Turn-Off Delay Time		---	14.5	---	
T <sub>f</sub>	Fall Time		---	3.5	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V, f=1MHz	---	11	---	pF
C <sub>oss</sub>	Output Capacitance		---	11	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	11	---	

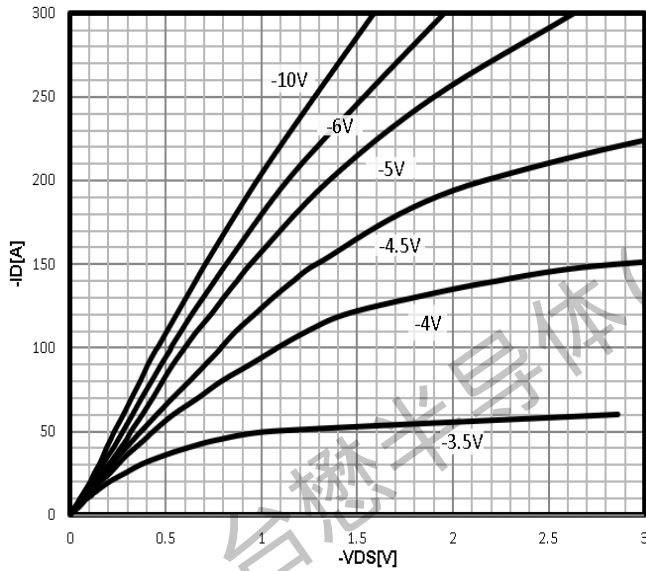
### Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	-120	A
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =-1A, T <sub>J</sub> =25°C	---	---	-1.5	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> =-1A, di/dt=100A/μs	---	1	---	nS
Q <sub>rr</sub>	Reverse Recovery Charge	I <sub>F</sub> =-1A, T <sub>J</sub> =25°C	---	1	---	nC

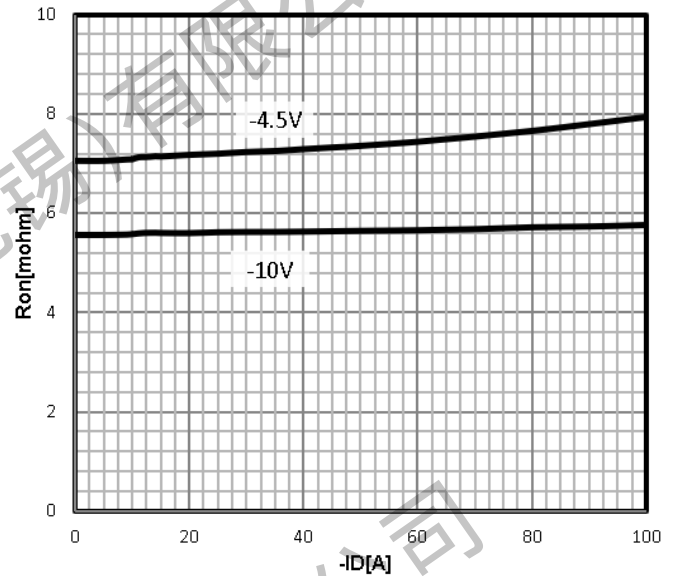
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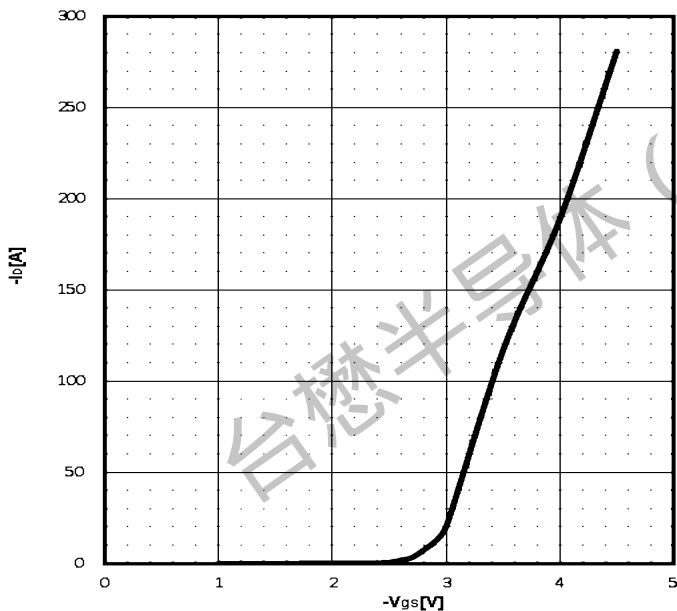
Typ. output characteristics  
 $I_D=f(V_{DS})$



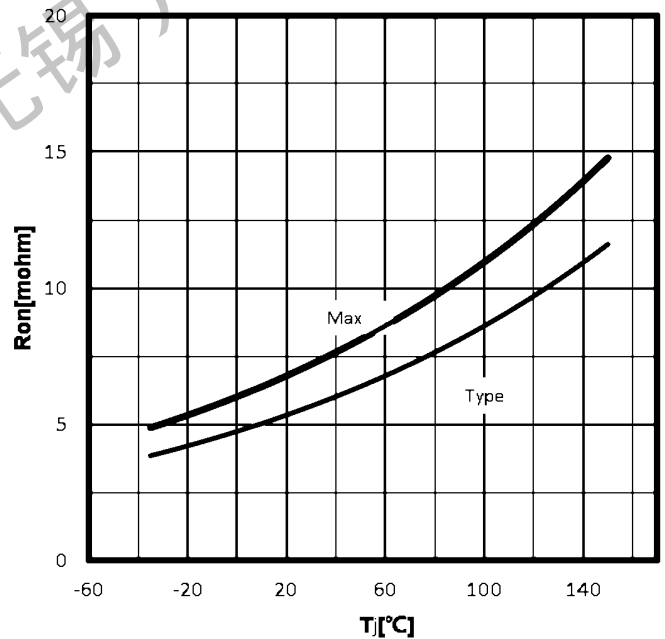
Typ. drain-source on resistance  
 $R_{DS(on)}=f(I_D)$



Typ. transfer characteristics  
 $I_D=f(V_{GS})$



Drain-source on-state resistance  
 $R_{DS(on)}=f(T_j); I_D=-15A; V_{GS}=-10V$

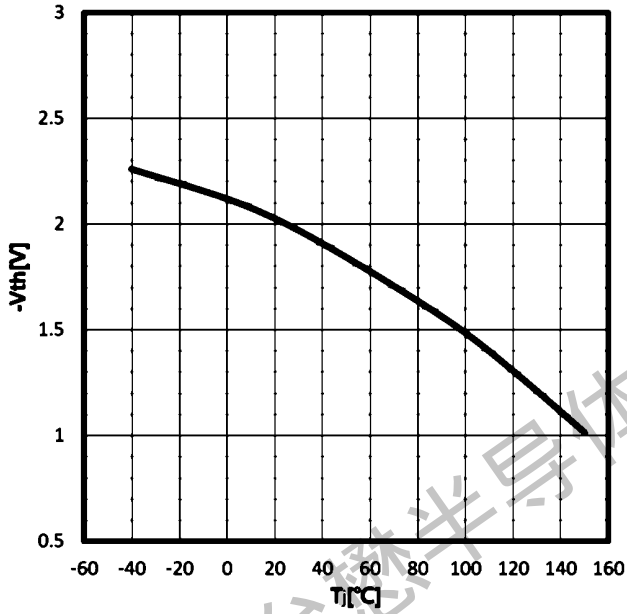




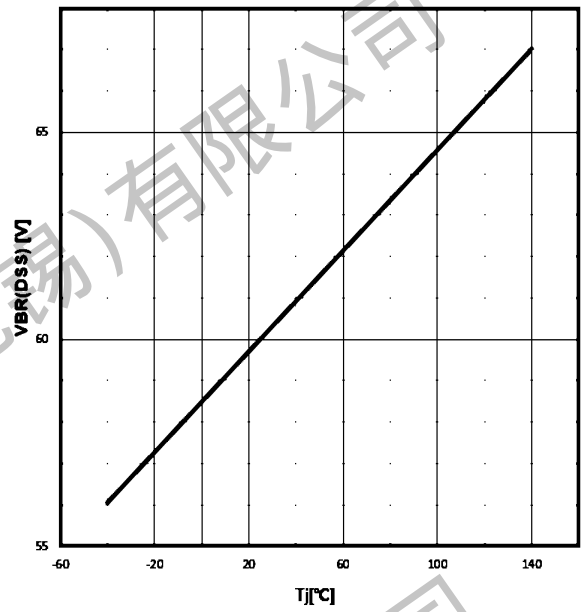
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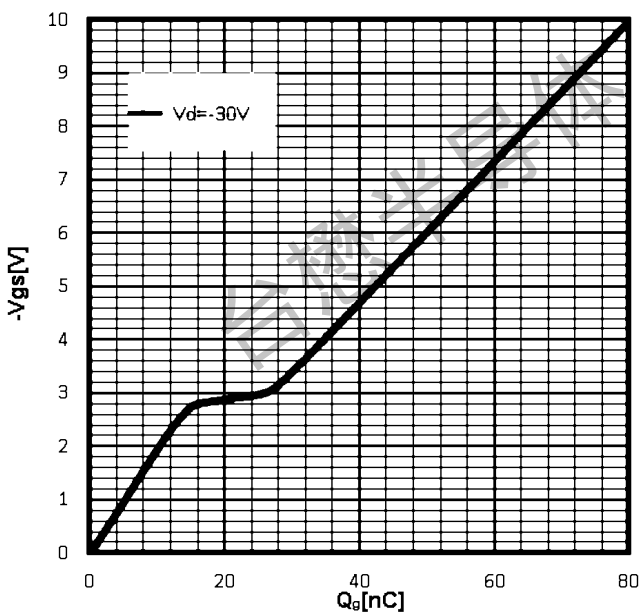
Gate Threshold Voltage -  
 $V_{TH}=f(T_j); I_D=-250\mu A$



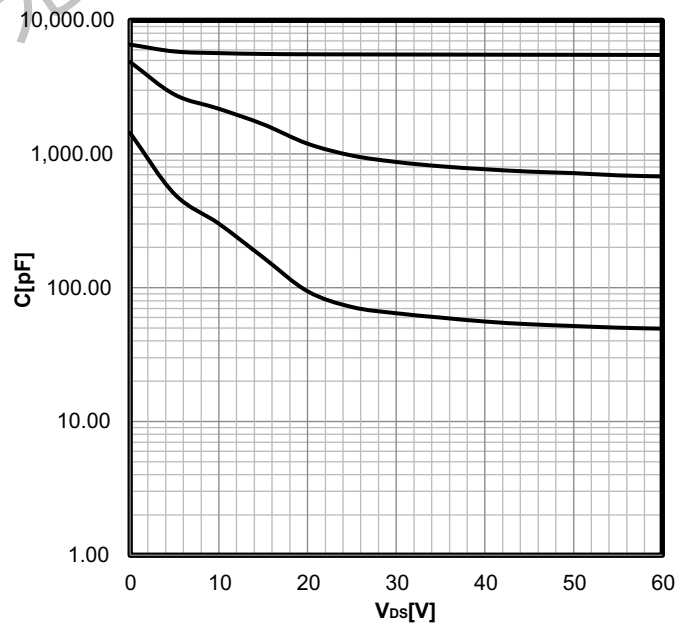
Drain-source breakdown voltage  
 $V_{BR(DSS)}=f(T_j); I_D=-250\mu A$



Typ. gate charge  
 $V_{GS}=f(Q_{gate}); I_D=-15A$



Typ. capacitances  
 $C=f(V_{DS}); V_{GS}=0V; f=1MHz$



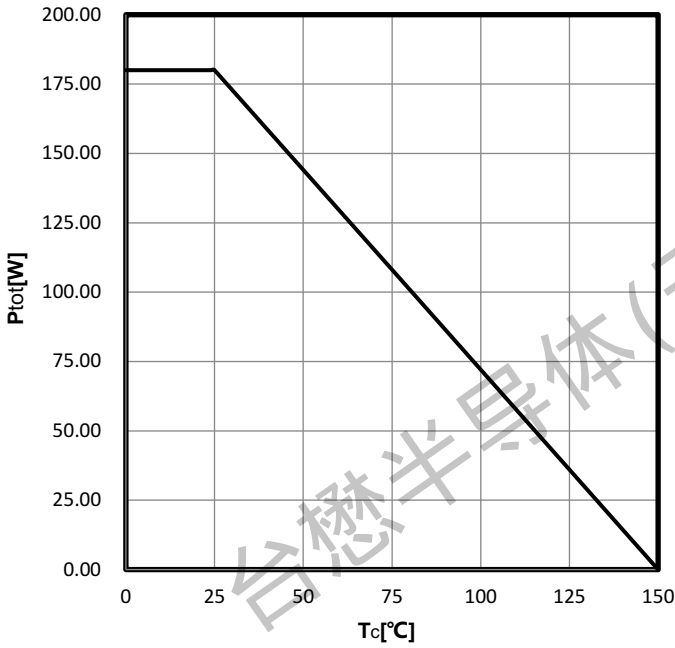


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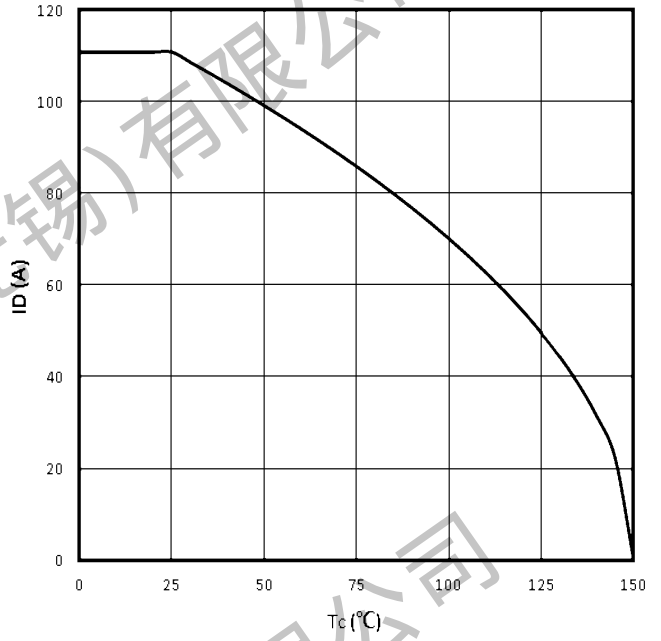
Power Dissipation

$P_{tot}=f(T_C)$



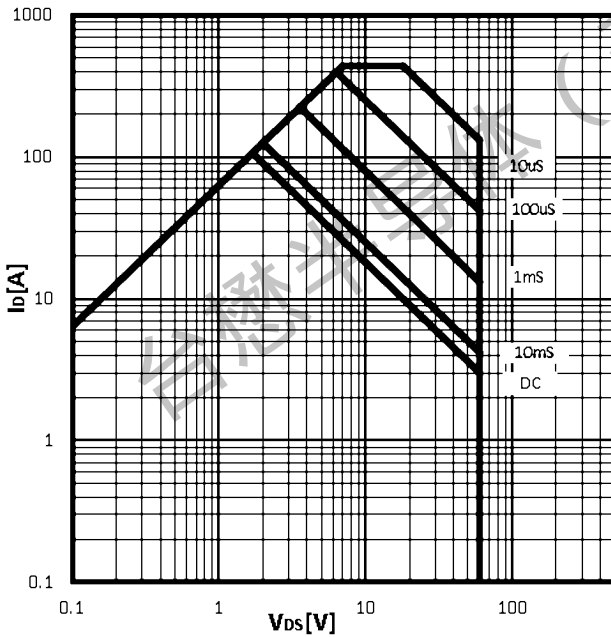
Maximum Drain Current

$-I_D=f(T_C)$



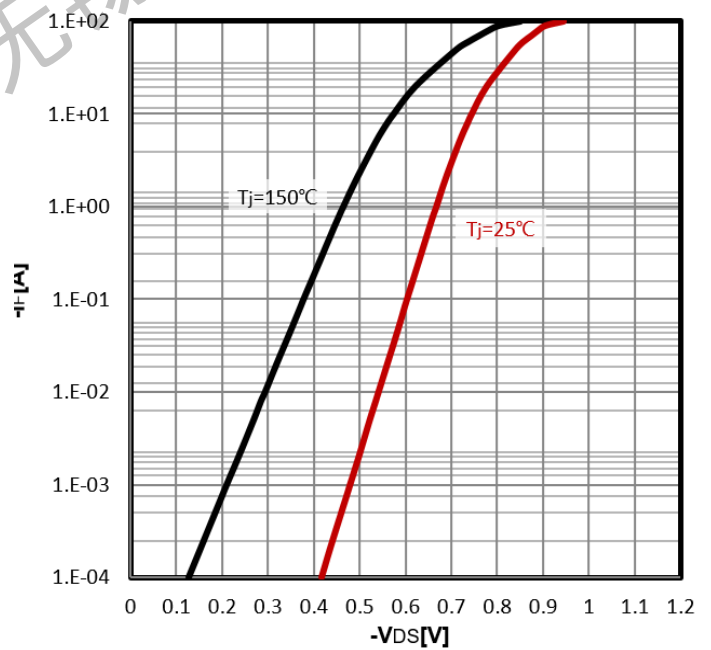
Safe operating area

$I_D=f(V_{DS})$



Body Diode Forward Voltage Variation

$-I_F=f(-V_{DS})$

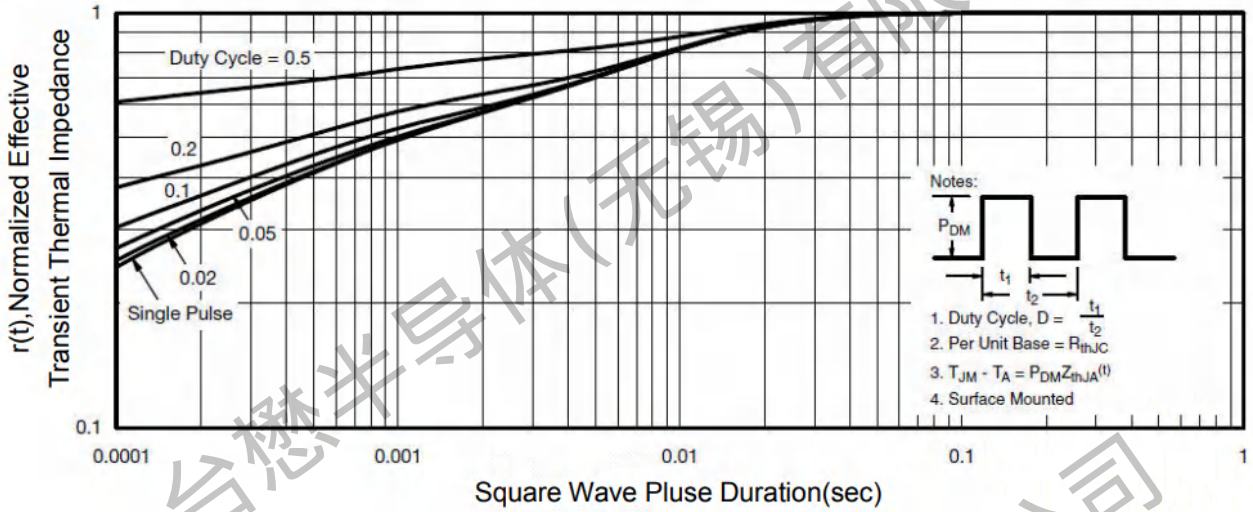


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Max. transient thermal impedance

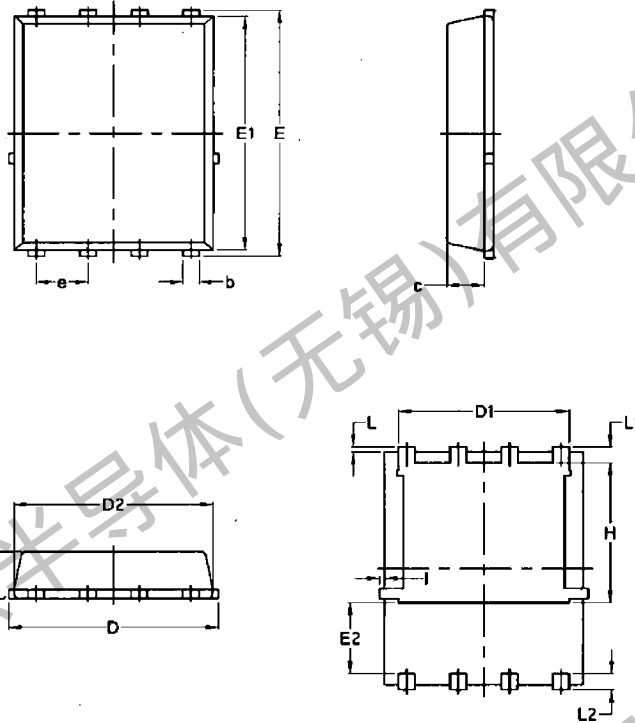
$$Z_{thJC}=f(t_p)$$



**TMG120P06NF**

**P-Channel Enhancement Mosfet**

**Package Mechanical Data:DFN5x6-8L**

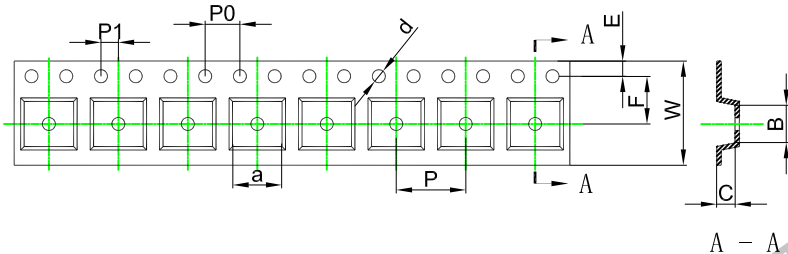


Symbol	Common			
	mm		Inch	
	Min	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	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

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PDFN5x6-8L Embossed Carrier Tape

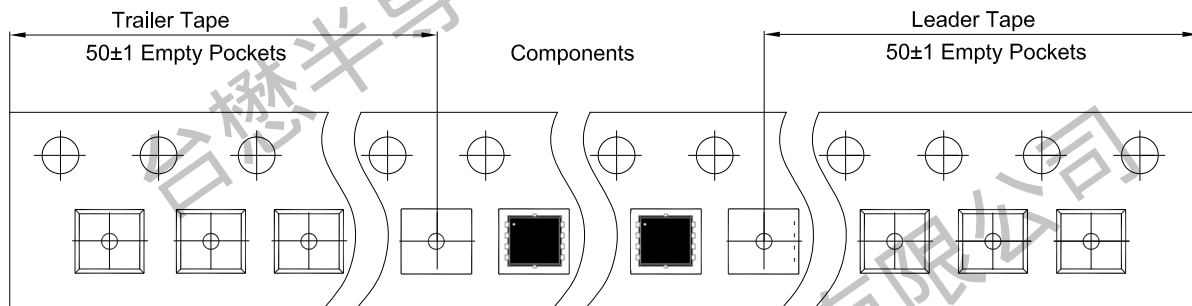


Packaging Description:

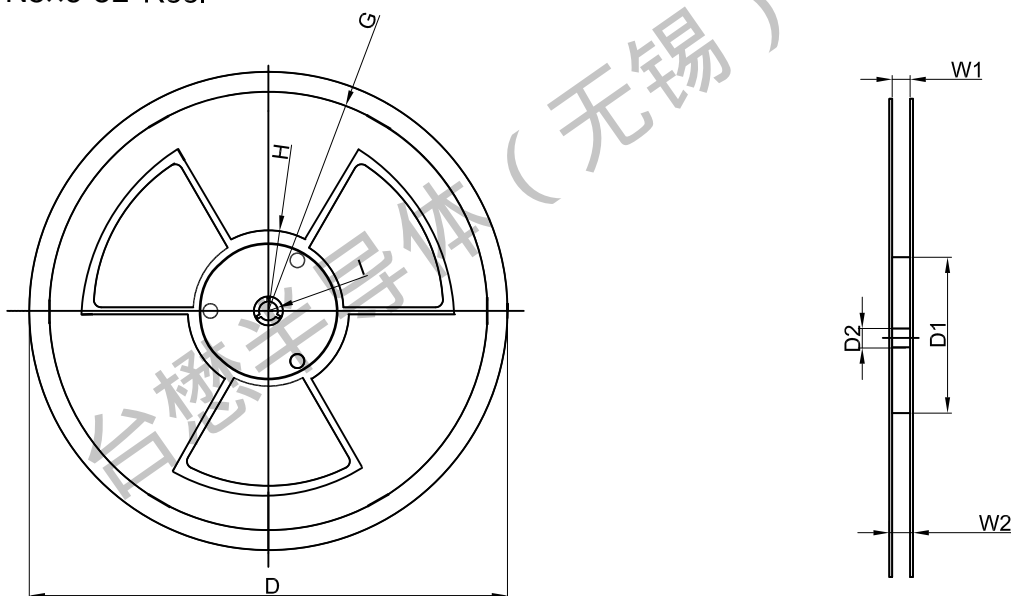
SOP-8L parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in 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
PDFN5x6-8L	6.40	5.40	2.10	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

PDFN5x6-8L Tape Leader and Trailer



PDFN5x6-8L 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
2023.06.23	23.06	Original	