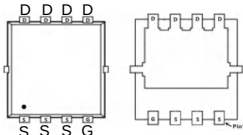
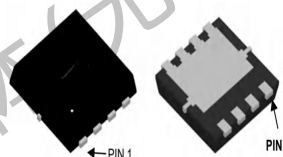
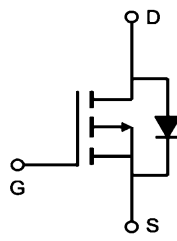


TM60PL03DF

P-Channel Enhancement Mosfet

General Description • Low $R_{DS(ON)}$ • RoHS and Halogen-Free Compliant Applications • Load switch • PWM General Features $V_{DS} = -25V$ $I_D = -60A$ $R_{DS(ON)} = 6.5\text{ m}\Omega(\text{typ.}) @ V_{GS} = -4.5V$ 100% UIS Tested 100% R_g Tested 	DF:DFN3x3-8L  Marking: 60PL03  PIN 1 																																																			
Absolute Maximum Ratings ($T_C=25^{\circ}\text{C}$ 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>-25</td><td>V</td></tr><tr><td>V_{GS}</td><td>Gate-Source Voltage</td><td>± 18</td><td>V</td></tr><tr><td>$I_D@T_C=25^{\circ}\text{C}$</td><td>Continuous Drain Current, $-V_{GS} @ -4.5V$</td><td>-60</td><td>A</td></tr><tr><td>$I_D@T_C=100^{\circ}\text{C}$</td><td>Continuous Drain Current, $-V_{GS} @ -4.5V$</td><td>-39</td><td>A</td></tr><tr><td>I_{DM}</td><td>Pulsed Drain Current</td><td>-240</td><td>A</td></tr><tr><td>$P_D@T_C=25^{\circ}\text{C}$</td><td>Total Power Dissipation</td><td>70</td><td>W</td></tr><tr><td>T_{STG}</td><td>Storage Temperature Range</td><td>-55 to 175</td><td>$^{\circ}\text{C}$</td></tr><tr><td>T_J</td><td>Operating Junction Temperature Range</td><td>-55 to 175</td><td>$^{\circ}\text{C}$</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</td><td>---</td><td>62</td><td>$^{\circ}\text{C/W}$</td></tr><tr><td>$R_{\theta JC}$</td><td>Thermal Resistance Junction-Case</td><td>---</td><td>3.6</td><td>$^{\circ}\text{C/W}$</td></tr></table>		Symbol	Parameter	Rating	Units	V_{DS}	Drain-Source Voltage	-25	V	V_{GS}	Gate-Source Voltage	± 18	V	$I_D@T_C=25^{\circ}\text{C}$	Continuous Drain Current, $-V_{GS} @ -4.5V$	-60	A	$I_D@T_C=100^{\circ}\text{C}$	Continuous Drain Current, $-V_{GS} @ -4.5V$	-39	A	I_{DM}	Pulsed Drain Current	-240	A	$P_D@T_C=25^{\circ}\text{C}$	Total Power Dissipation	70	W	T_{STG}	Storage Temperature Range	-55 to 175	$^{\circ}\text{C}$	T_J	Operating Junction Temperature Range	-55 to 175	$^{\circ}\text{C}$	Symbol	Parameter	Typ.	Max.	Unit	$R_{\theta JA}$	Thermal Resistance Junction-Ambient	---	62	$^{\circ}\text{C/W}$	$R_{\theta JC}$	Thermal Resistance Junction-Case	---	3.6	$^{\circ}\text{C/W}$
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TM60PL03DF
P-Channel Enhancement Mosfet
Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D = -250μA	-25	---	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -20V, V _{GS} = 0V,	-	-	-1	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±12V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	-0.7	-0.9	-1.2	V
R _{DS(on)}	Static Drain-Source on-Resistance note3	V _{GS} =-4.5V, I _D =-15A	-	6.5	8.0	mΩ
		V _{GS} =-2.5V, I _D =-12A	-	8	12	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-10V, V _{GS} =0V, f = 1.0MHz	-	4590	-	pF
C _{oss}	Output Capacitance		-	505	-	pF
C _{rss}	Reverse Transfer Capacitance		-	440	-	pF
Q _g	Total Gate Charge	V _{DS} =-10V, I _D =-15A, V _{GS} =-4.5V	-	46	-	nC
Q _{gs}	Gate-Source Charge		-	7.3	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	10	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =-10V, I _D =-14A, R _{GEN} =2.7Ω, V _{GS} =-10V	-	8	-	ns
t _r	Turn-on Rise Time		-	59	-	ns
t _{d(off)}	Turn-off Delay Time		-	111	-	ns
t _f	Turn-off Fall Time		-	43	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-60	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-240	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _S =-20A	-	-	-1.2	V
trr	Reverse Recovery Time	T _J =25℃, I _{SD} =-15A, V _{GS} =0V	-	18	-	ns
Qrr	Reverse Recovery Charge	di/dt=-100A/μs	-	7.7	-	nC

TM60PL03DF

P-Channel Enhancement Mosfet

Typical Performance Characteristics

Figure 1: Output Characteristics

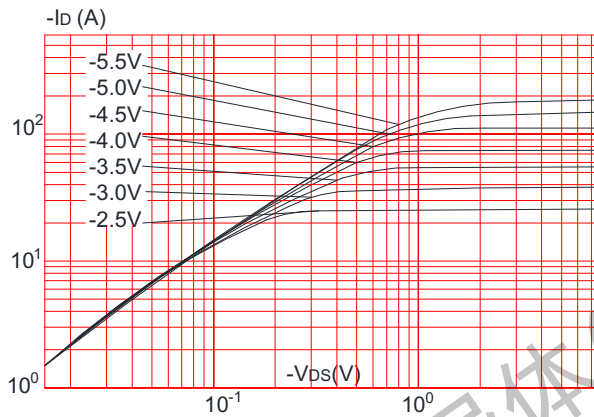


Figure 2: Typical Transfer Characteristics

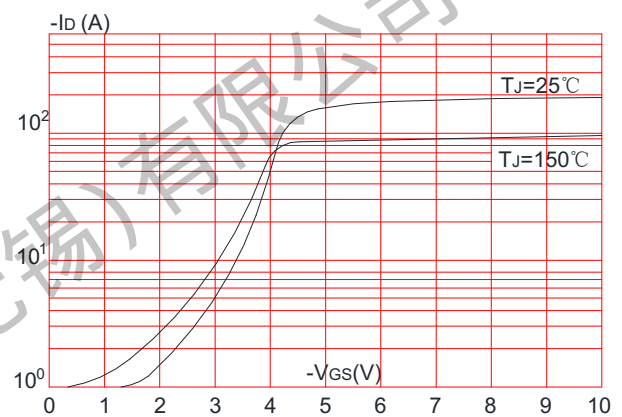


Figure 3: On-resistance vs. Drain Current

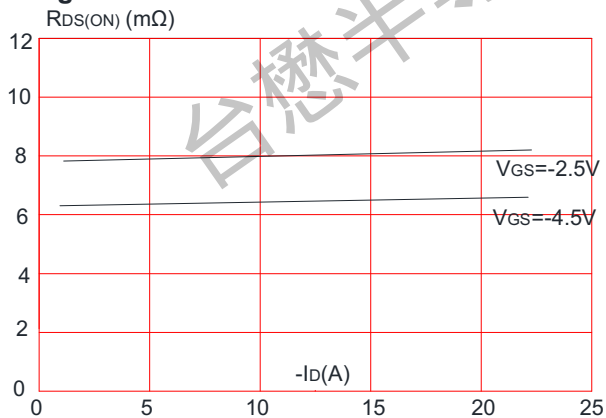


Figure 4: Body Diode Characteristics

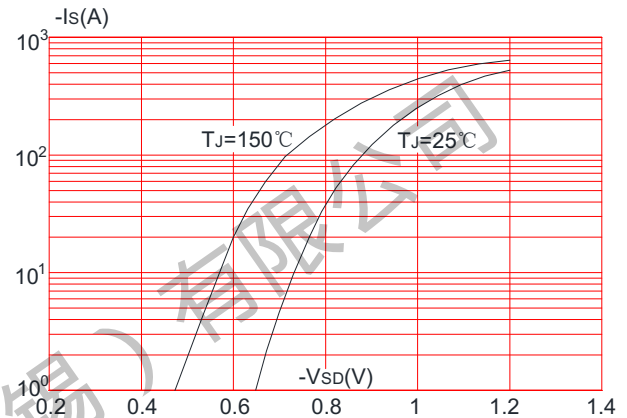


Figure 5: Gate Charge Characteristics

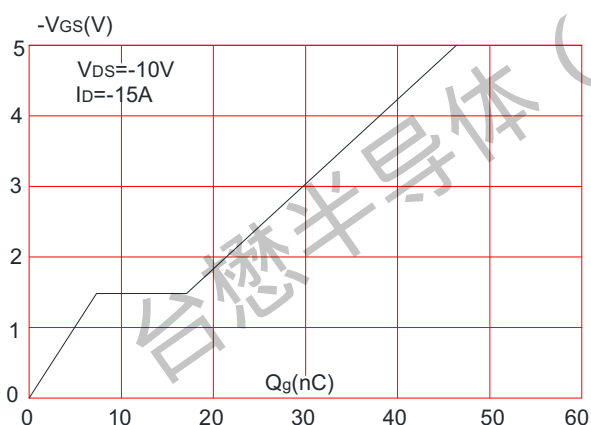
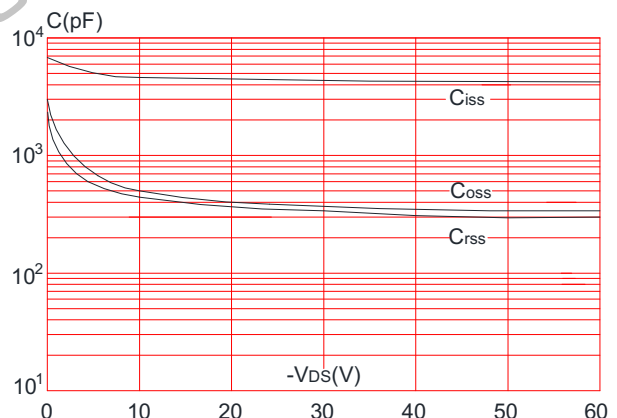


Figure 6: Capacitance Characteristics



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Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

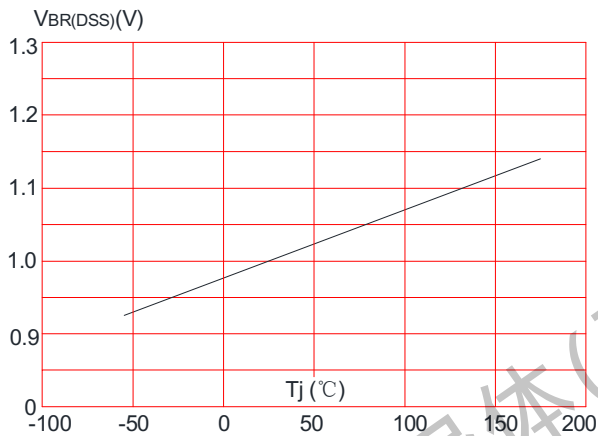


Figure 8: Normalized on Resistance vs. Junction Temperature

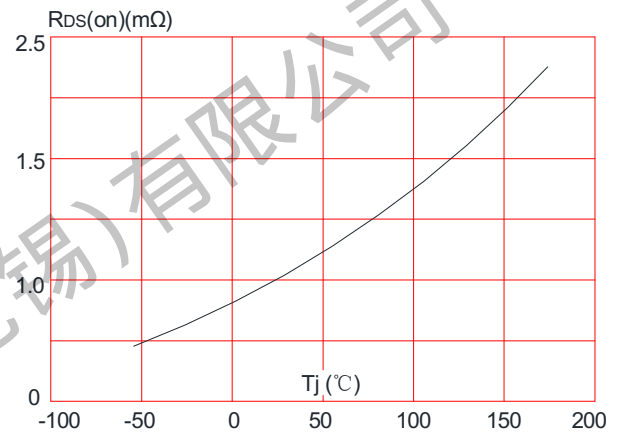


Figure 9: Maximum Safe Operating Area

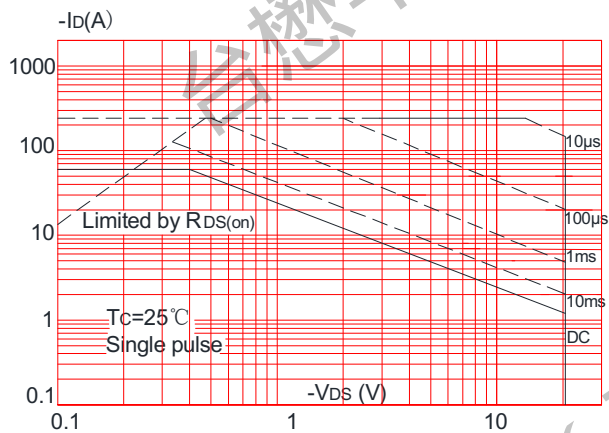


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

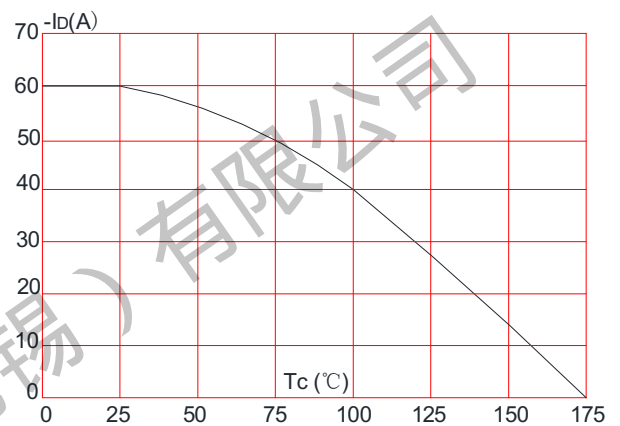
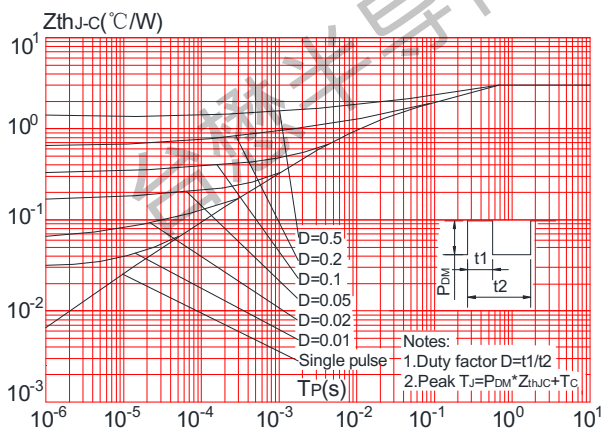


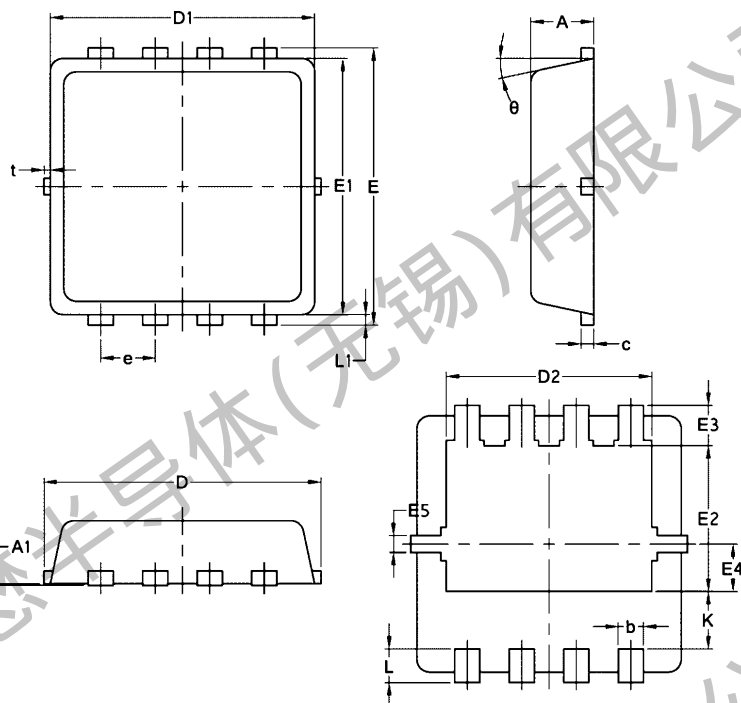
Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



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Package Mechanical Data:DFN3x3-8L

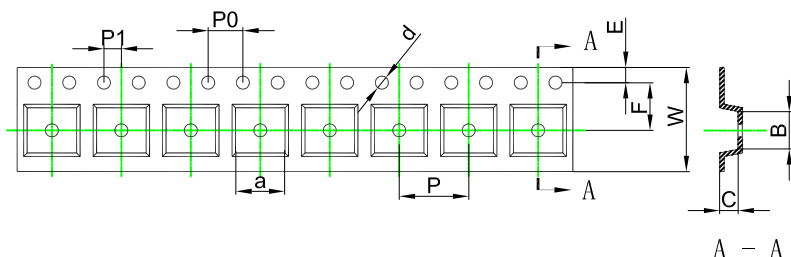


Symbol	Common		
	mm		
	Mim	Nom	Max
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.20	0.30	0.40
c	0.10	0.152	0.25
D	3.15	3.30	3.45
D1	3.00	3.15	3.25
D2	2.29	2.45	2.65
E	3.15	3.30	3.45
E1	2.90	3.05	3.20
E2	1.54	1.74	1.94
E3	0.28	0.48	0.65
E4	0.37	0.57	0.77
E5	0.10	0.20	0.30
e	0.60	0.65	0.70
K	0.59	0.69	0.89
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
t	0	0.075	0.13
Φ	10	12	14

TM60PL03DF

P-Channel Enhancement Mosfet

PDFN3×3-8L Embossed Carrier Tape



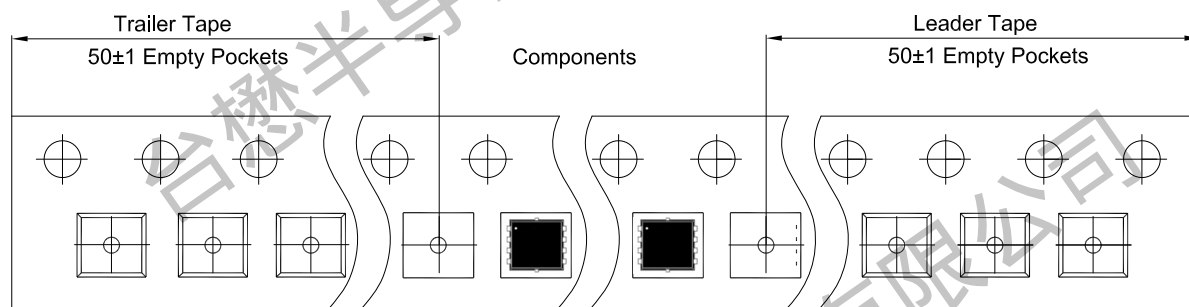
Packaging Description:

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).

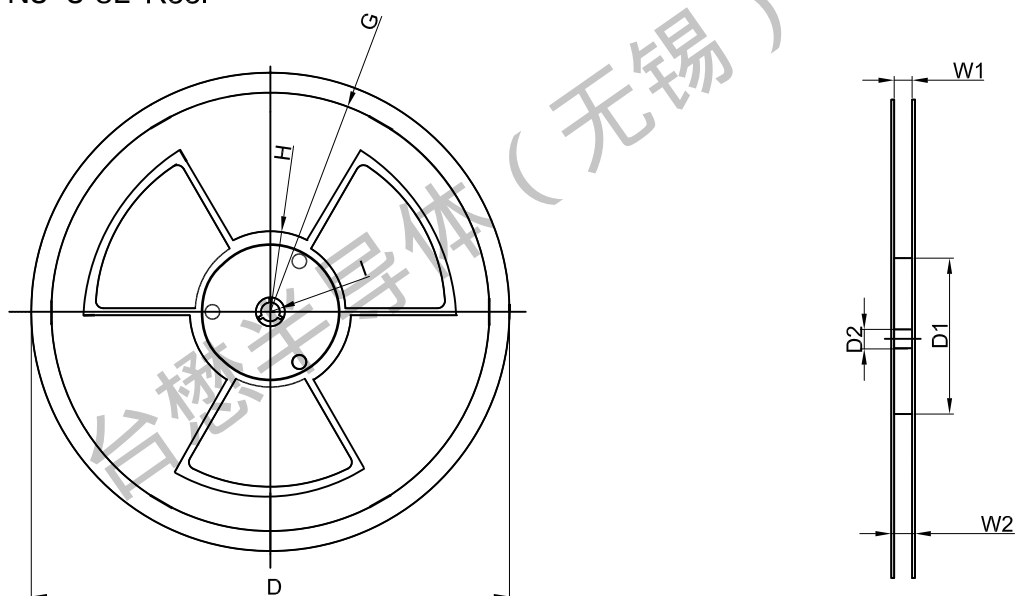
ALL DIM IN mm

Dimensions are in millimeter										
Pkg type	a	B	C	d	E	F	P0	P	P1	W
PDFN3×3-8L	6.40	5.40	2.10	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

PDFN3×3-8L Tape Leader and Trailer



PDFN3×3-8L 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
2023.07.14	23.07	Original	