TM30G03DF

N+P-Channel Enhancement Mosfet

General Description

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

Applications

- Load switch
- PWM

General Features

N Channel

V_{DS} =30V, I_D =33A

$R_{DS(ON)}$=9mΩ @ V_{GS}=10V

P Channel

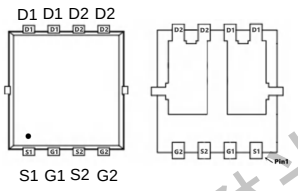
V_{DS} = -30V,I_D = -28A

$R_{DS(ON)}$=19mΩ @ V_{GS}=-10V

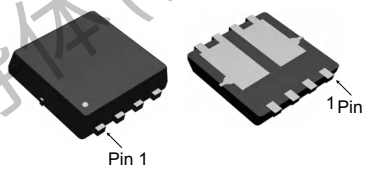
100% UIS Tested

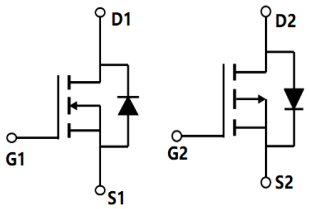
100% R_g Tested

Green Product



DF:DFN3x3-8L





Marking :30G03 OR 4616

Absolute Maximum Ratings(T_A=25°C Unless Otherwise Noted)

Symbol	Parameter	Rating		Units
		N-Channel	P-Channel	
V_{DS}	Drain-Source Voltage	30	-30	V
V_{GS}	Gate-Source Voltage	±20	±20	V
I_D@T_A=25°C	Continuous Drain Current, V_{GS} @ 10V[1]	33	-28	A
I_D@T_A=70°C	Continuous Drain Current, V_{GS} @ 10V[1]	21.5	-18.2	A
I_{DM}	Pulsed Drain Current[2]	122	-104	A
EAS	Single Pulse Avalanche Energy[3]	20	25	mJ
P_D@T_C=25°C	Total Power Dissipation[4]	3.3	5.6	W
T_{STG}	Storage Temperature Range	-55 to 175	-55 to 175	°C
T_J	Operating Junction Temperature Range	-55 to 175	-55 to 175	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	---	45	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	5	°C/W

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N-Channel Electrical Characteristics: (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=30V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
On Characteristics[3]						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	1.2	1.6	2.0	V
$R_{DS(ON)}$	Drain-Source On Resistance note3	V_{GS}=10V,I_D=10A	---	9	15	mΩ
		V_{GS}=4.5V,I_D=5A	---	16	22	
Dynamic Characteristics[4]						
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1MHz	---	580	---	pF
C_{oss}	Output Capacitance		---	110	---	
C_{rss}	Reverse Transfer Capacitance		---	92	---	
Qg	Gate Charge	V_{GS}=10V V_{DS}=15V I_D=10A		13	---	nc
Qgs	Gate-Source Charge			4.5	---	
Qgd	Gate-Drain Charge			3.3	---	
Switching Characteristics[4]						
$t_{d(on)}$	Turn-On Delay Time	V_{DS}=30V, I_D= 10A, R_{REN} =3Ω ,V_{GS}=10V	---	3	---	ns
t_r	Rise Time		---	6	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	19	---	ns
t_f	Fall Time		---	5	---	ns
Drain-Source Diode Characteristics						
I_S	Continuous Drain to Source Diode	---	---	----	33	A
I_{SM}	Pulsed Drain to Source Diode	---	---	---	121	A
V_{SD}	Source-Drain Diode Forward Voltage	V_{GS}=0V,I_S=11A	---	0.8	1.2	V
t_{rr}	Body Diode Reverse Recovery Time	I_F=11A,dI/dt=100A/μs	---	7	---	ns
Q_{rr}	Body Diode Reverse Recovery		---	5.9	---	nC

Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition : T_J=25℃, V_{DD}=15V, V_G=10V, L=0.5mH, Rg=25Ω, I_{AS}=9A
   T_J=25℃, V_{DD}= -15V, V_G= -10V, L=0.5mH, Rg=25Ω, I_{AS}= -10A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

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Typical Performance Characteristics-N

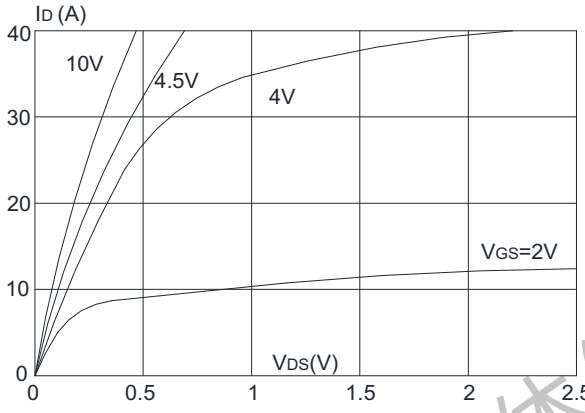


Figure1: Output Characteristics

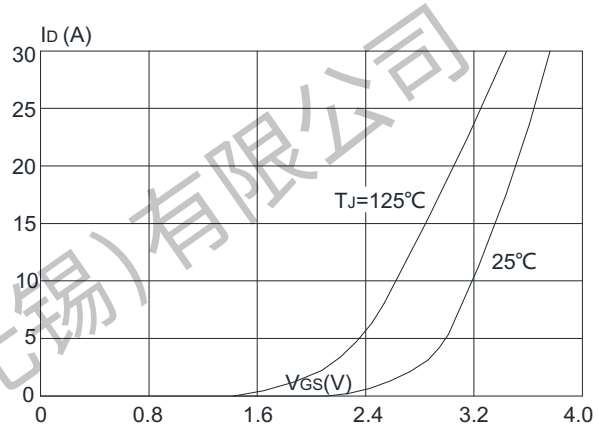
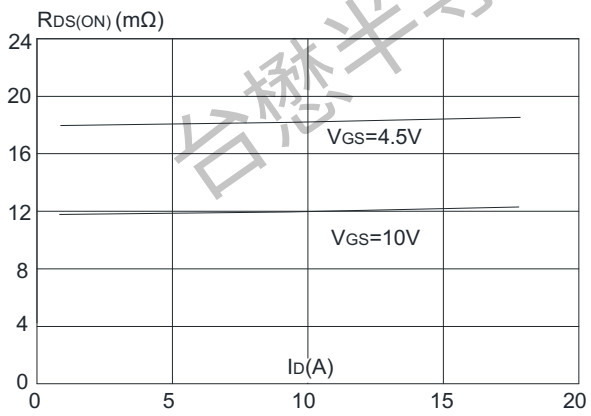


Figure 2: Typical Transfer Characteristics



Fi ure 3: On-resistance vs. Drain Current

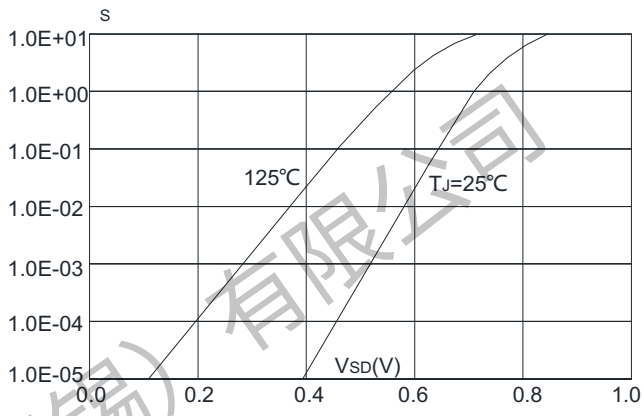


Figure 4: Body Diode Characteristics

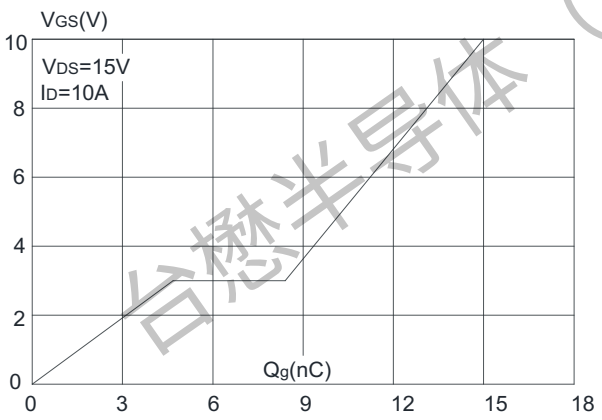


Figure 5: Gate Charge Characteristics

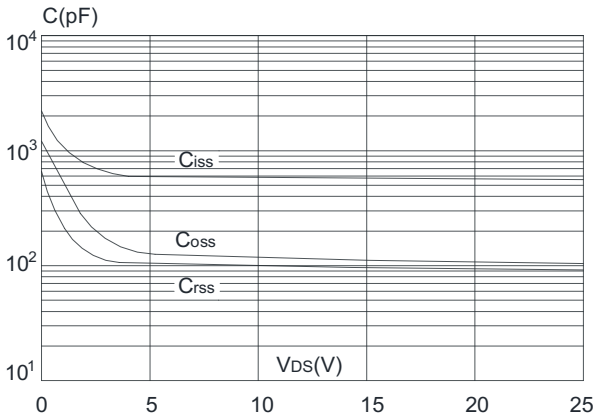


Figure 6: Capacitance Characteristics

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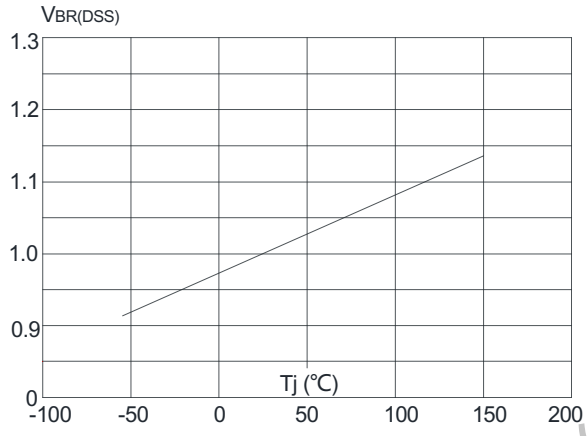

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

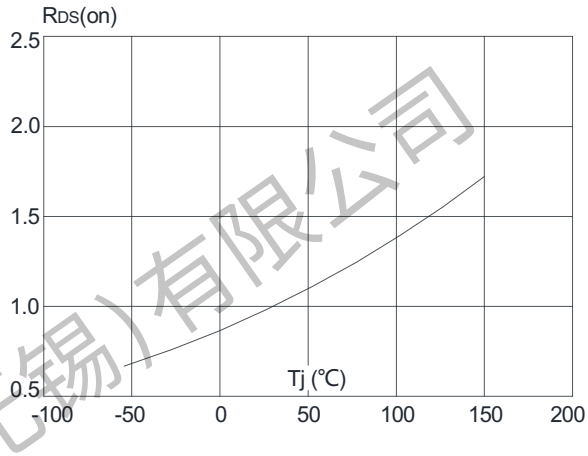

Figure 8: Normalized on Resistance vs. Junction Temperature

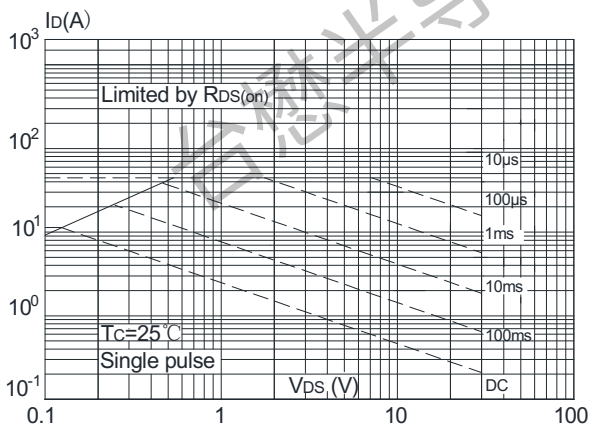

Figure 9: Maximum Safe Operating Area

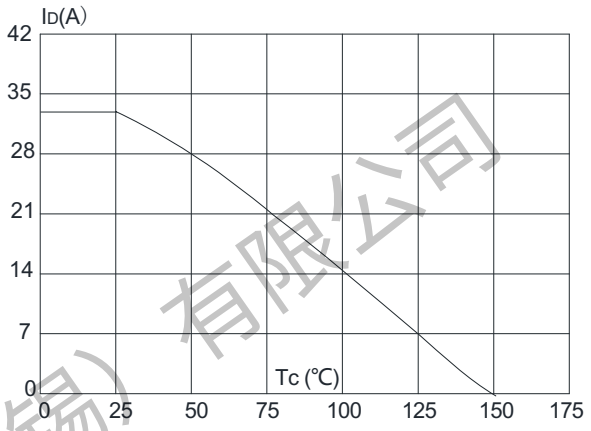

Figure 10: Maximum Continuous Drain Current vs. Case Tem erature

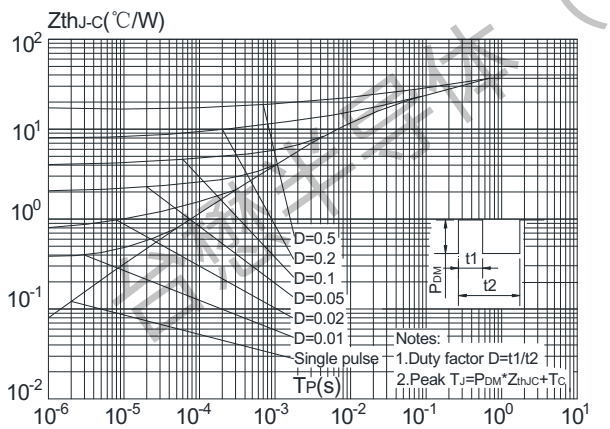

Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

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P-Channel Electrical Characteristics: (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	-30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=-30V	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
On Characteristics[3]						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	-1	-1.5	-2	V
$R_{DS(ON)}$	Drain-Source On Resistance[note3]	V_{GS}=-10V,I_D=-10A	---	19	25	mΩ
		V_{GS}=-4.5V,I_D=-5A	---	25	38	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=-15V, V_{GS}=0V, f=1MHz	---	1150	---	pF
C_{oss}	Output Capacitance		---	150	---	
C_{rss}	Reverse Transfer Capacitance		---	135	---	
Switching Characteristics[4]						
$t_{d(on)}$	Turn-On Delay Time	V_{DD}= -15V, I_D= --1A, V_{GS}= -10V, R_{GEN}=6Ω R_D=15Ω	---	12	---	ns
t_r	Rise Time		---	13	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	195	---	ns
t_f	Fall Time		---	95	---	ns
Q_g	Total Gate Charge	V_{GS}=-10V,V_{DS}=-15V,I_D=-8A	---	50	---	nC
Q_{gs}	Gate-Source Charge		---	9.5	---	nC
Q_{gd}	Gate-Drain "Miller" Charge		---	8.3	---	nC
Drain-Source Diode Characteristics						
I_S	Continuous Drain to Source Diode	---	---	---	-28	A
I_{SM}	Pulsed Drain to Source Diode	---	---	---	-104	A
V_{SD}	Source-Drain Diode Forward Voltage	V_{GS}=0V,I_S=-11A	---	-0.8	-1.2	V
Trr	Reverse Recovery Time	T_J=25℃, I_F=-2A,dI/dt=-100A/μs	---	37	---	ns
Qrr	Reverse Recovery Charge		---	36	---	nC

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Typical Performance Characteristics-P

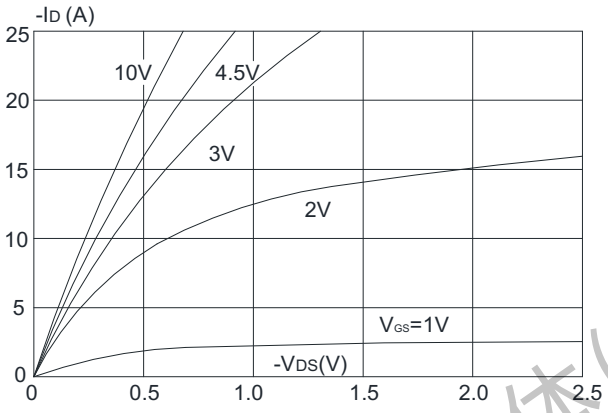

Figure1: Output Characteristics

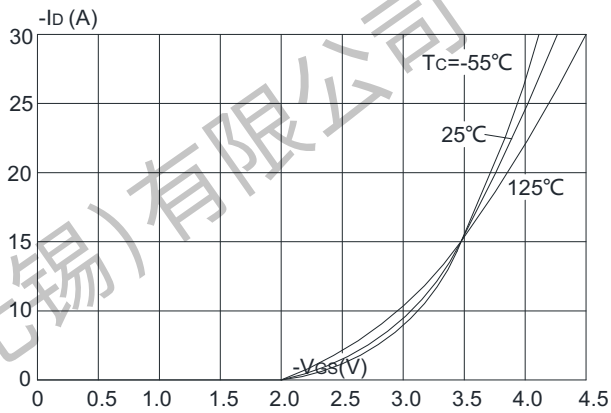

Figure 2: Typical Transfer Characteristics

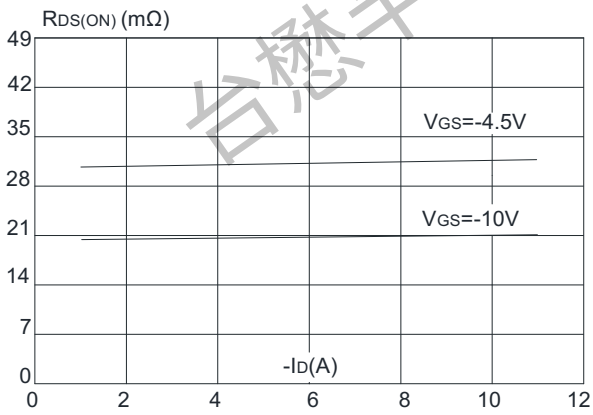

Figure 3: On-resistance vs. Drain Current

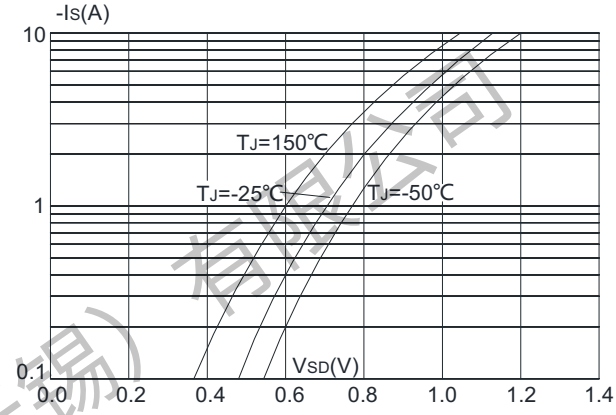

Figure 4: Body Diode Characteristics

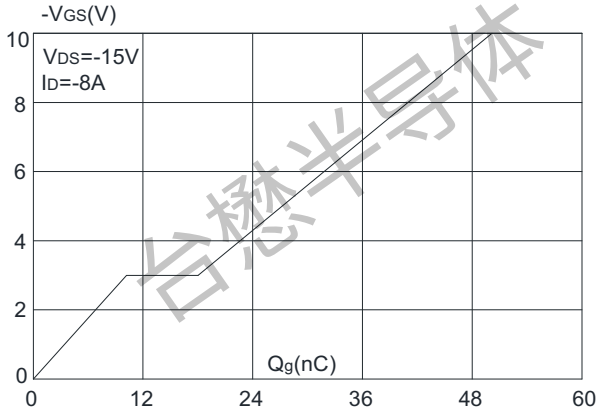

Figure 5: Gate Charge Characteristics

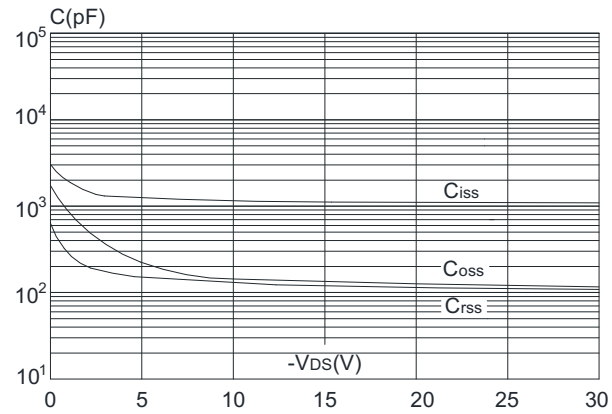

Figure 6: Capacitance Characteristics

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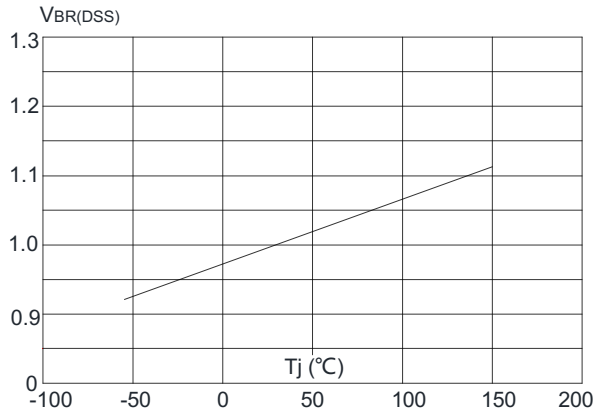

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

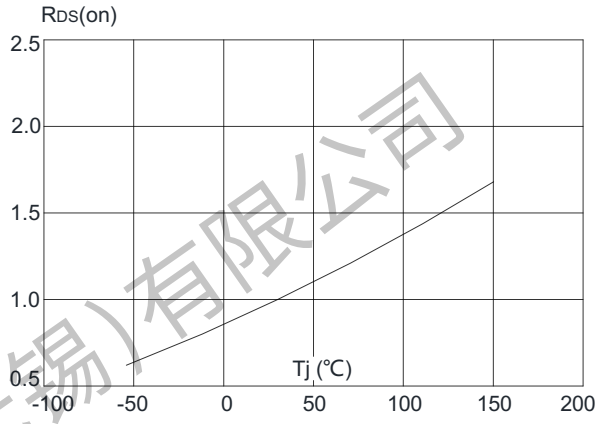

Figure 8: Normalized on Resistance vs. Junction Temperature

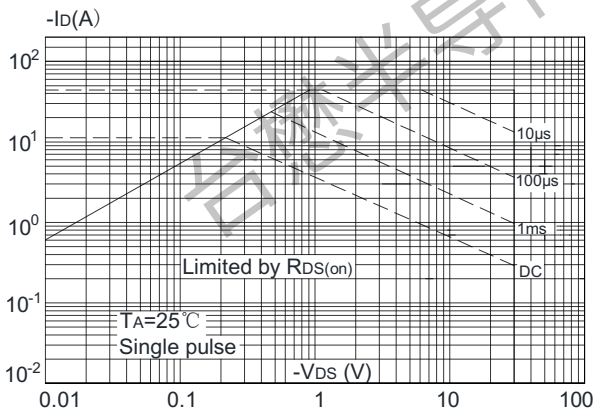

Figure 9: Maximum Safe Operating Area

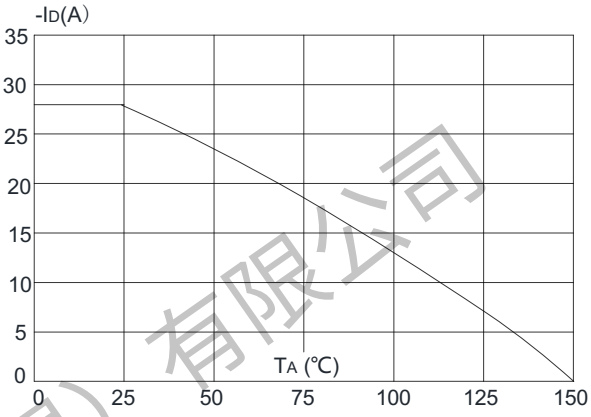

Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

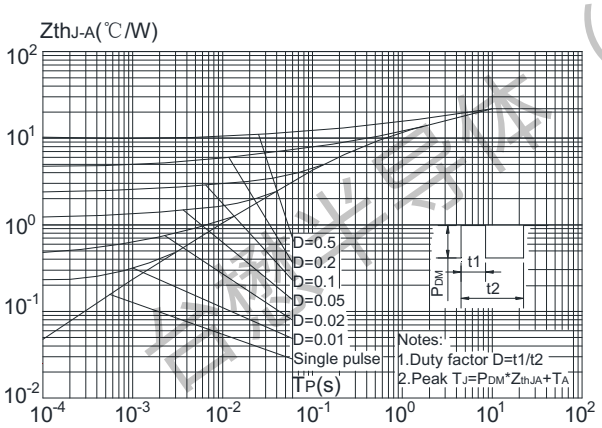

Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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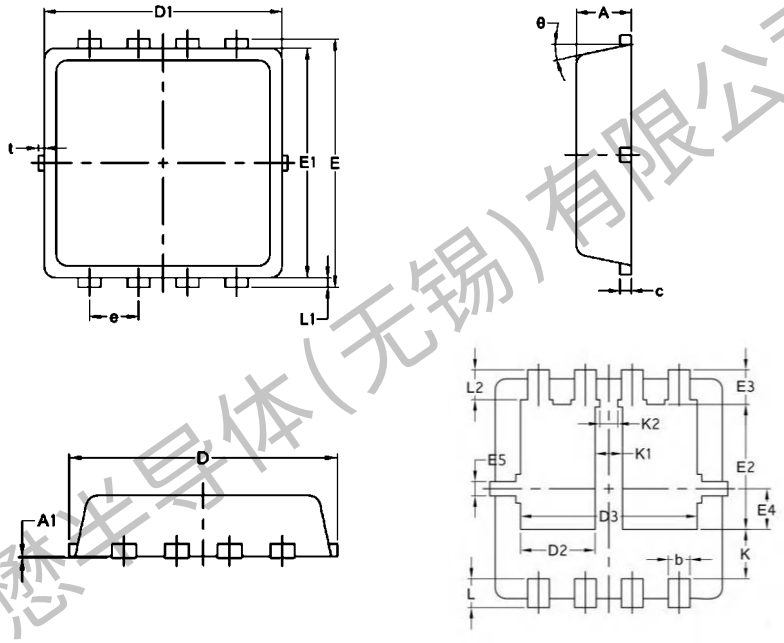
Package Mechanical Data:DFN3x3−8L



Symbol	Common		
	Mm		
	Min	Nom	Max
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.25	0.30	0.39
c	0.14	0.152	0.20
D	3.20	3.30	3.45
D1	3.05	3.15	3.25
D2	0.84	1.04	1.24
D3	2.30	2.45	2.60
E	3.20	3.30	3.40
E1	2.95	3.05	3.15
E2	1.60	1.74	1.90
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	0.50	0.69	0.80
K1	0.30	0.38	0.53
K2	0.15	0.25	0.35
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
L2	0.27	0.42	0.57
t	0	0.075	0.13
Φ	10°	12°	14°

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TM30G03DF

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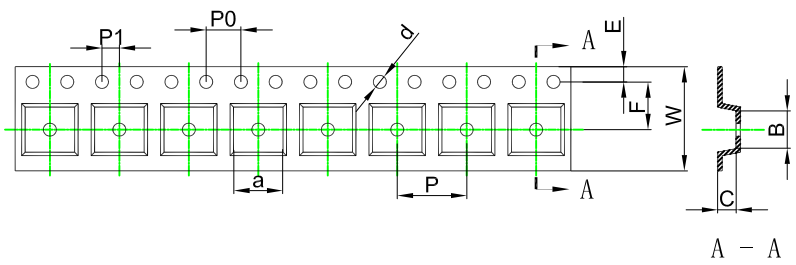
PDFN3×3-8L Embossed Carrier Tape



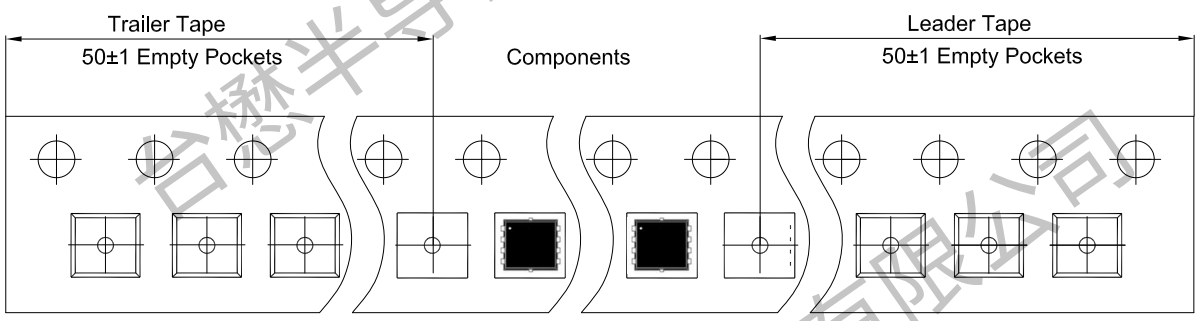
Packaging Description:

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).

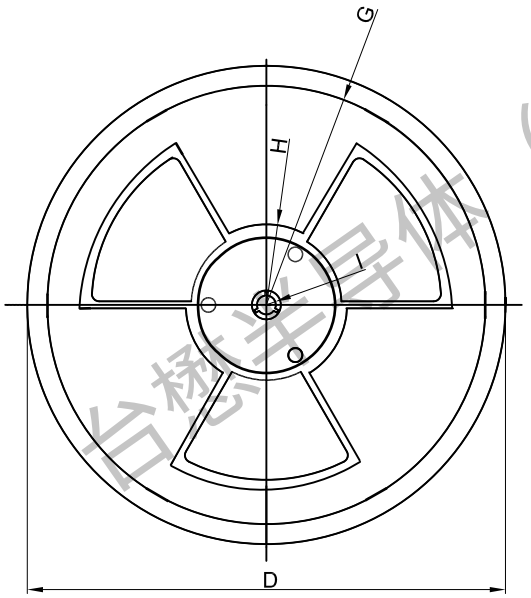
ALL DIM IN mm

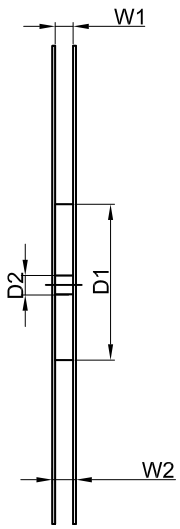
Dimensions are in millimeter										
Pkg type	a	B	C	d	E	F	P0	P	P1	W
PDFN3×3-8L	6.40	5.40	2.10	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

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
2023.11.06	23.11	Original	

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