TM150N04NF

N -Channel Enhancement Mosfet

General Description

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

Applications

- Load switch
- PWM

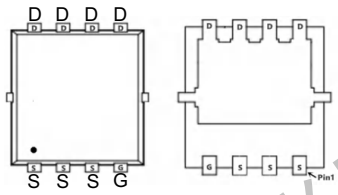
General Features

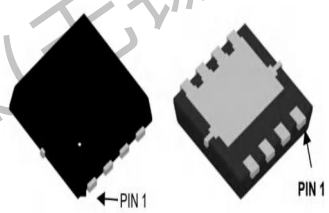
V_{DS} = 40V I_D =150A

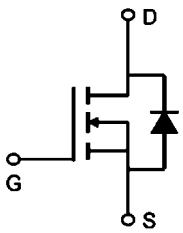
$R_{DS(ON)}$=1.85 mΩ(typ.)@V_{GS}=10V

100% UIS Tested
100% R_g Tested

NF:DFN5x6-8L







Marking:150N04

Absolute Maximum Ratings (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V	150	A
I_{DM}	Pulsed Drain Current	380	A
EAS	Single Pulse Avalanche Energy	500	mJ
I_{AS}	Avalanche Current	30	A
P_D@T_C=25℃	Total Power Dissipation	96	W
T_{STG}	Storage Temperature Range	-55 to 175	℃
T_J	Operating Junction Temperature Range	-55 to 175	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	---	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	---	1.3	℃/W

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Electrical Characteristics (T_A=25℃unless otherwise noted)

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS} = 0 V,I_D = 250 μA	BV_{DSS}	40	-	-	V
Drain-Source Leakage Current	V_{DS} = 40 V, V_{GS} = 0 V	I_{DSS}	-	-	1	μA
Gate Leakage Current	V_{GS} = ± 20 V, V_{DS} = 0 V	I_{GSS}	-	-	±100	nA
Gate-Source Threshold Voltage	V_{DS} = V_{GS} , I_D = 250 μA	$V_{GS(th)}$	1.2	1.6	2.0	V
Drain-Source On-State Resistance	V_{GS} = 10 V, I_D = 20 A	$R_{DS(on)}$	-	1.85	2.7	mΩ
	V_{GS} = 4.5 V, I_D =15 A		-	2.5	3.5	mΩ
Input Capacitance	VDS=25 V , VGS=0V , f=1MHz	C_{iss}	-	6680	-	pF
Output Capacitance		C_{oss}	-	1256	-	pF
Reverse Transfer Capacitance		C_{rss}	-	780	-	pF
Turn-on Delay Time	VDD=20 V , VGS=10 V , RG=3.7 Ω，ID=70A	$t_{d(ON)}$	-	25	-	ns
Rise Time		t_r	-	80	-	ns
Turn-Off Delay Time		$t_{d(OFF)}$	-	85	-	ns
Fall Time		t_f	-	42	-	ns
Total Gate Charge	VDS=20V , VGS=4.5V , ID=70A	Q_G	-	170	-	nC
Gate to Source Charge		Q_{GS}	-	52	-	nC
Gate to Drain Charge		Q_{GD}	-	70	-	nC

Characteristics	Test Condition	Symbo	Min.	Typ.	Max.	Unit
Maximun Body-Diode Continuous Current		I_S	-	-	150	A
Drain-Source Diode Forward Voltage	VGS=0V , IS=20A , TJ=25℃	V_{SD}	-	-	1.2	V
Reverse Recovery Time	T_J = 25℃, I_F= 40A di / dt = 100 A/μs	trr	-	31	-	ns
Reverse Recovery Charge		Qrr	-	27	-	nC

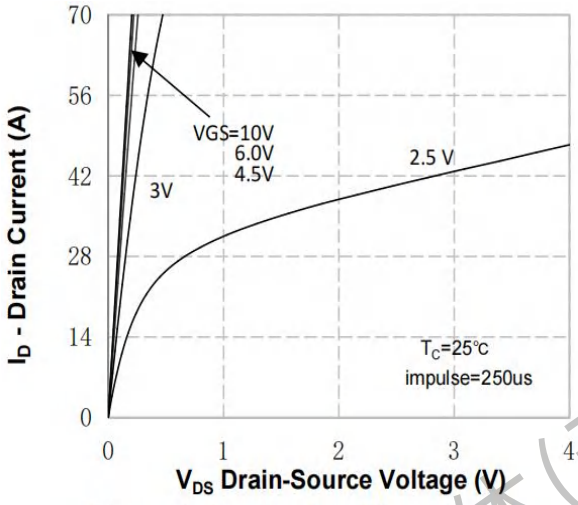

Figure 1. On-Region Characteristics

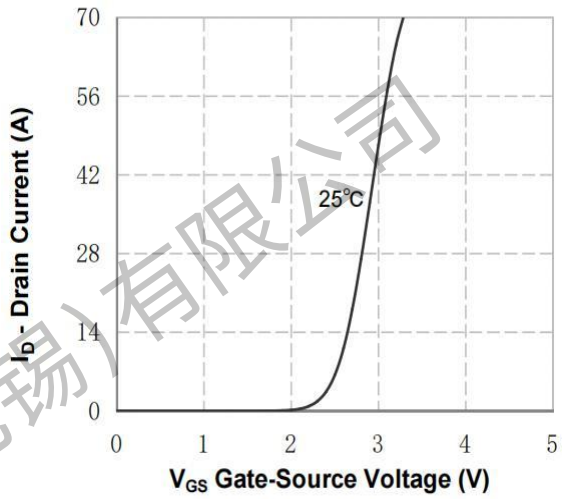

Figure 2. Transfer Characteristics

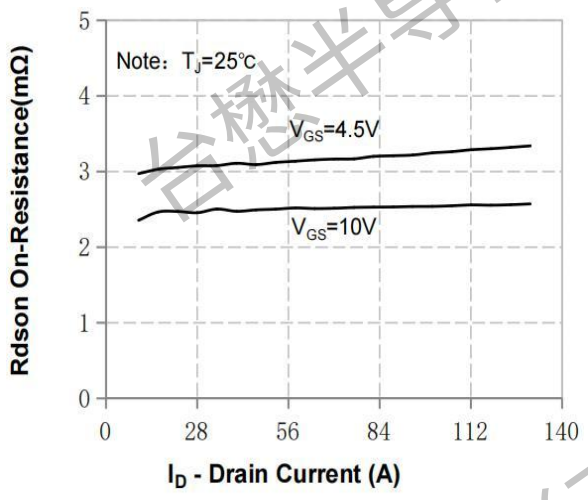

Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

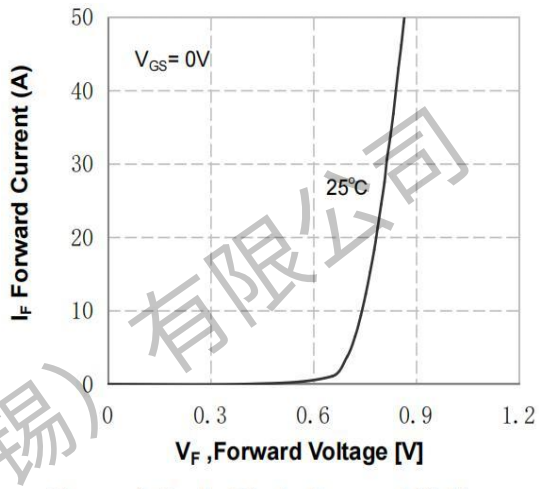

Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

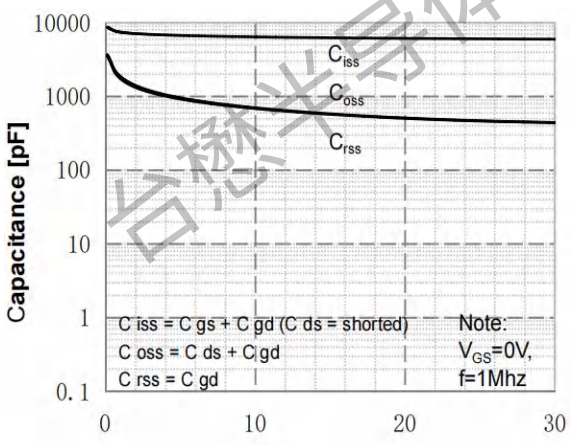

Figure 5. Capacitance Characteristics

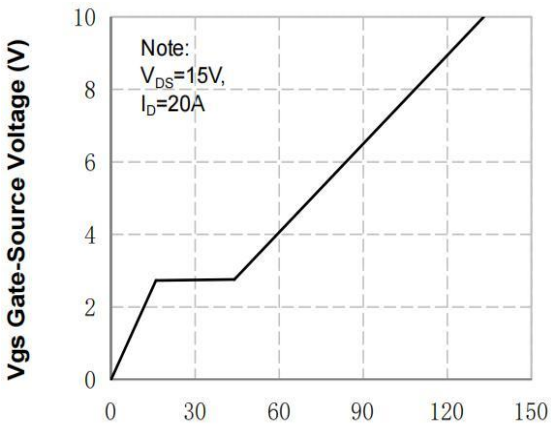

Figure 6. Gate Charge Characteristics

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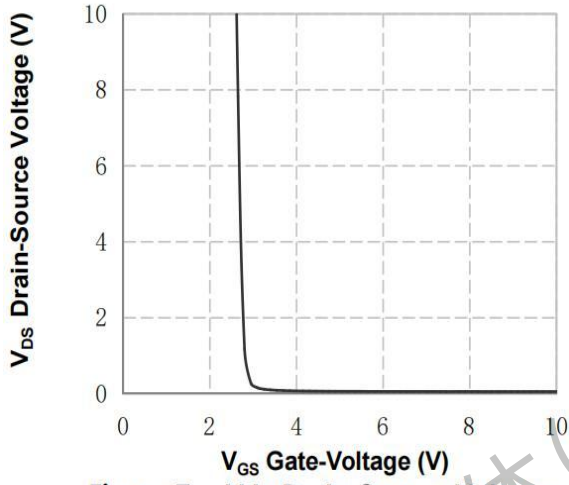


Figure 7. Vds Drain-Source Voltage vs Gate Voltage

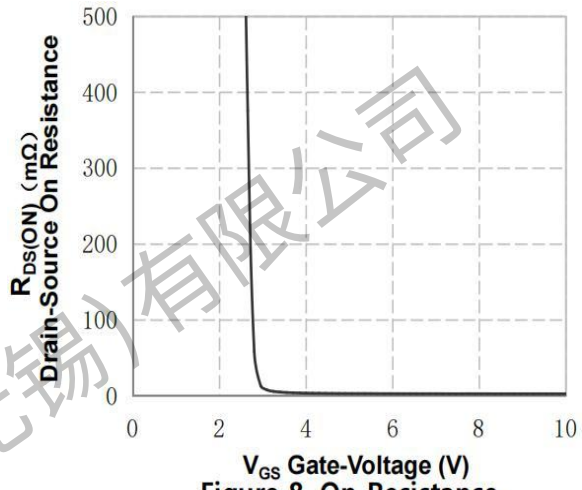


Figure 8. On-Resistance vs Gate Voltage

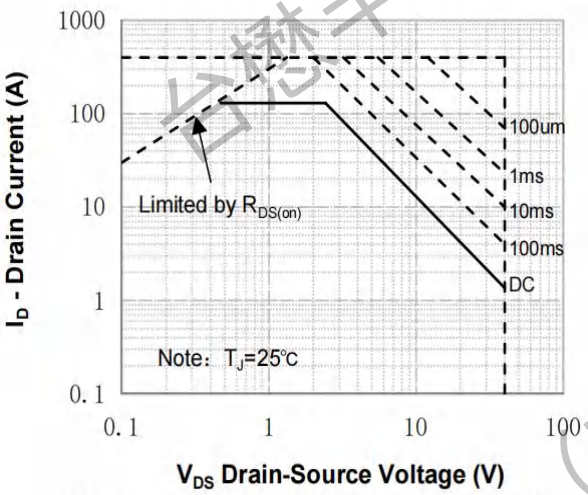


Figure 9. Maximum Safe Operating Area

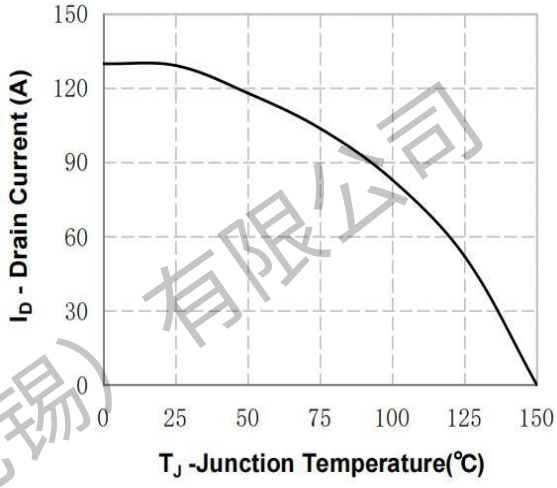


Figure 10. Maximum Continuous Drain Current vs Case Temperature

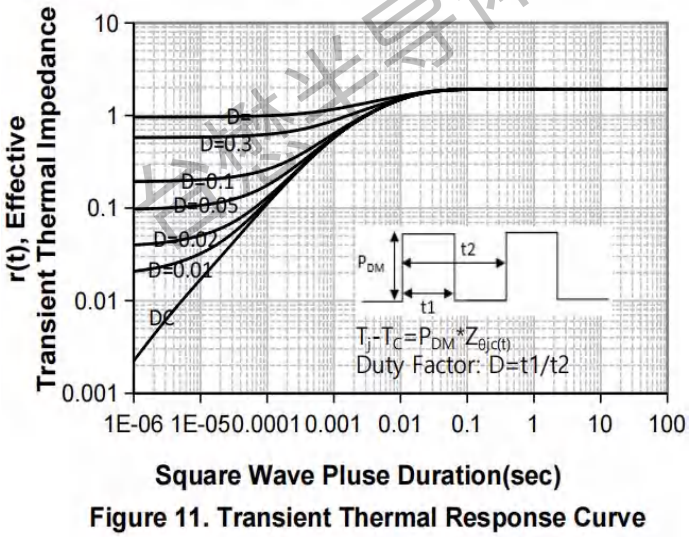
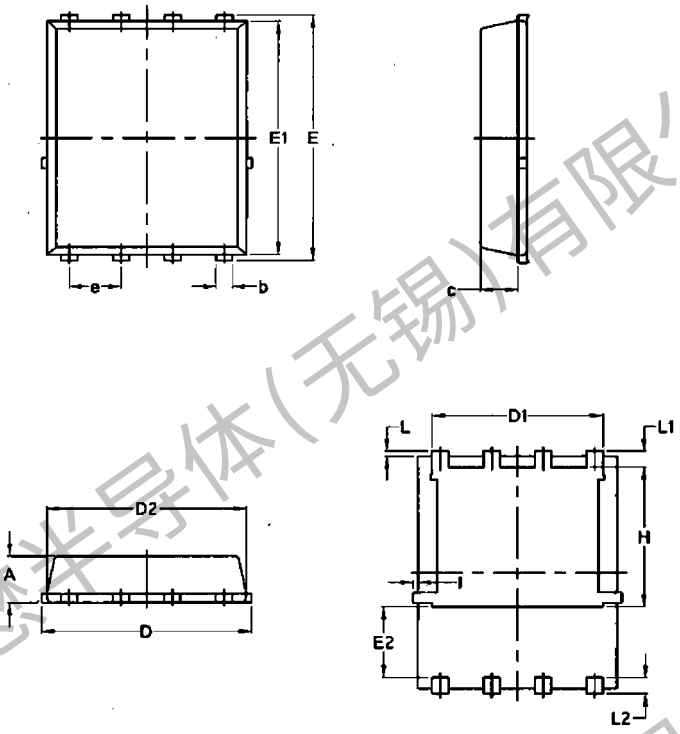


Figure 11. Transient Thermal Response Curve

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

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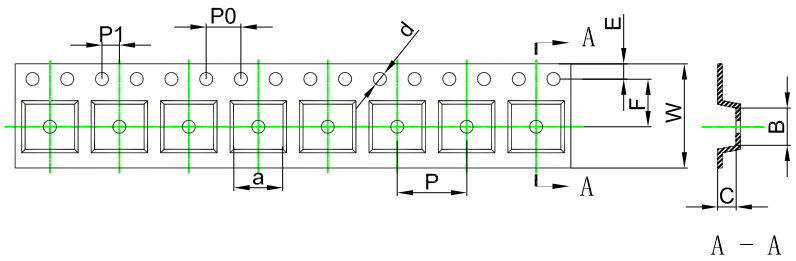
PDFN5×6-8L Embossed Carrier Tape



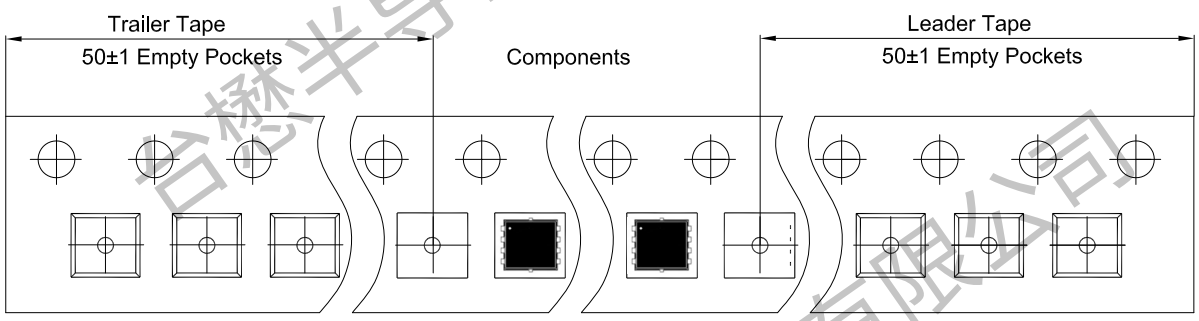
Packaging Description:

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).

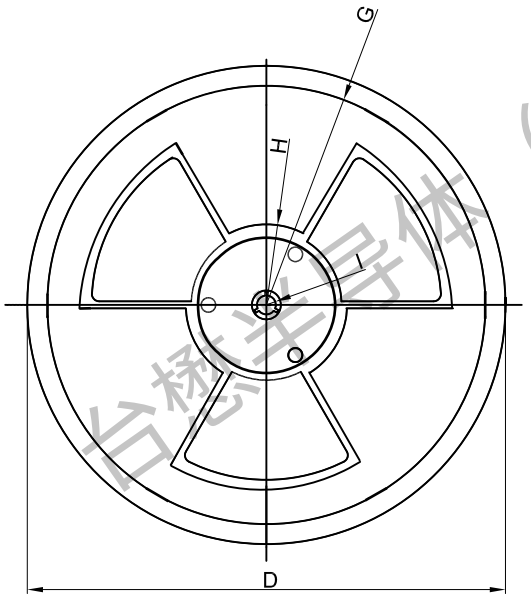
ALL DIM IN mm

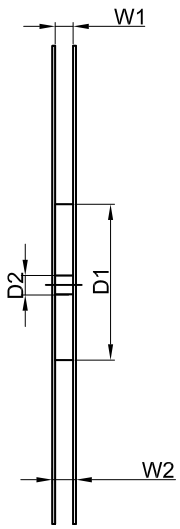
Dimensions are in millimeter										
Pkg type	a	B	C	d	E	F	P0	P	P1	W
PDFN5×6-8L	6.40	5.40	2.10	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

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
2023.07.28	23.07	Original	