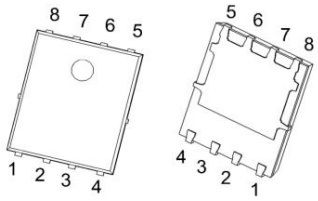
40V N-Channel MOSFET

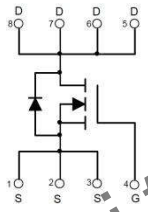
1.Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	6.5mΩ@10V	50A
	8.5mΩ@4.5V	

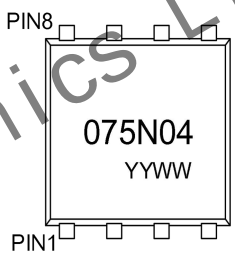
PDFN5*6-8L



Schematic diagram



Marking



075N04 : Device Code
YY : Year Code
WW : Week Code

2.Features

- V_{DS} 40V
- I_D 50A
- $R_{DS(ON)}$(at V_{GS}=10V) ＜9 mohm
- $R_{DS(ON)}$(at V_{GS}=4.5V) ＜13 mohm
- Trench Power LV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

3.Applications

- High current load applications
- Load switching
- Hard switched and high frequency circuits
- Uninterruptible power supply

4.Absolute Maximum rating（T_A = 25℃ unless otherwise noted）

Parameter		Symbol	Value	Unit
Drain - Source Voltage		V_{DS}	40	V
Gate - Source Voltage		V_{GS}	±20	V
Continuous Drain Current		I_D	50	A
Pulsed Drain Current [1]		I_{DM}	200	A
Single Pulsed Avalanche Energy [2]		E_{AS}	105	mJ
Power Dissipation [3]	T_C = 25℃	P_D	25	W
Thermal Resistance from Junction to Case		$R_{\theta JC}$	5	℃/W
Junction Temperature		T_J	150	℃
Storage Temperature		T_{STG}	-55~ +150	℃

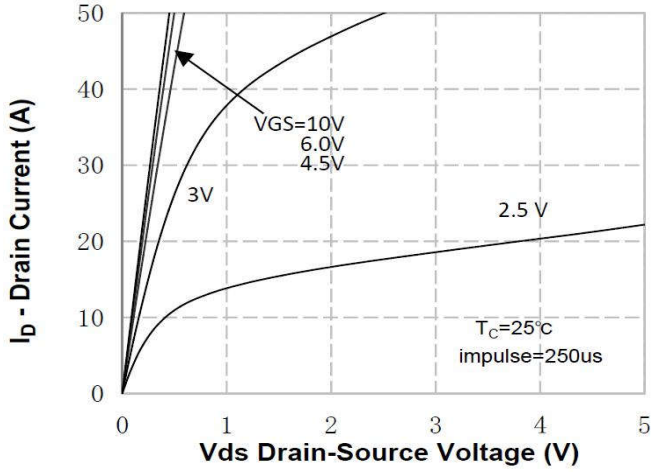
5.Electrical Characteristics（T_A = 25℃ unless otherwise noted）

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 40V, V_{GS} = 0V			1	μA
Gate - Body Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.5	2.5	V
Drain-source On-resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 20A		6.5	9	mΩ
		V_{GS} = 4.5V, I_D = 10A		8.5	13	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 25V, V_{GS} = 0V, f = 1MHz		2852		pF
Output Capacitance	C_{oss}			161		
Reverse Transfer Capacitance	C_{rss}			124		
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} = 20V, V_{GS} =10V, I_D = 50A		36.1		nC
Gate-source Charge	Q_{gs}			5.4		
Gate-drain Charge	Q_{gd}			10.1		
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 30V, V_{GS} = 10V, R_L = 0.3Ω, I_D = 40A,R_G = 4.7Ω		8		ns
Turn-on Rise Time	t_r			12		
Turn-off Delay Time	$t_{d(off)}$			44		
Turn-off Fall Time	t_f			13		
Source - Drain Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V, I_S = 20A			1.2	V

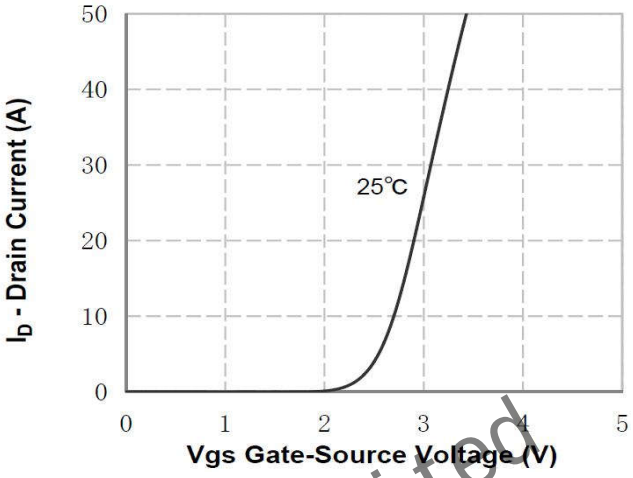
Notes:

1. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.
2. E_{AS} condition: V_{DD} = 20V,V_{GS} = 10V, L = 0.5mH, R_G = 25Ω, Starting T_J = 25°℃.
3. The power dissipation P_D is limited by $T_{J(MAX)}$ = 150°C.And device mounted on a large heat sink
4. Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C

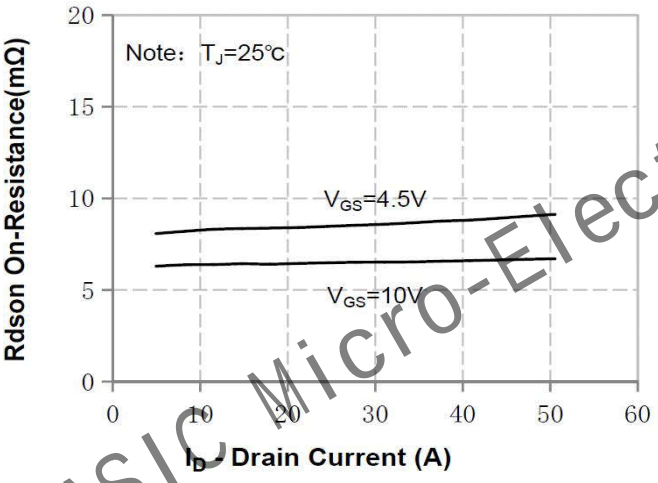
6.Typical Characteristic



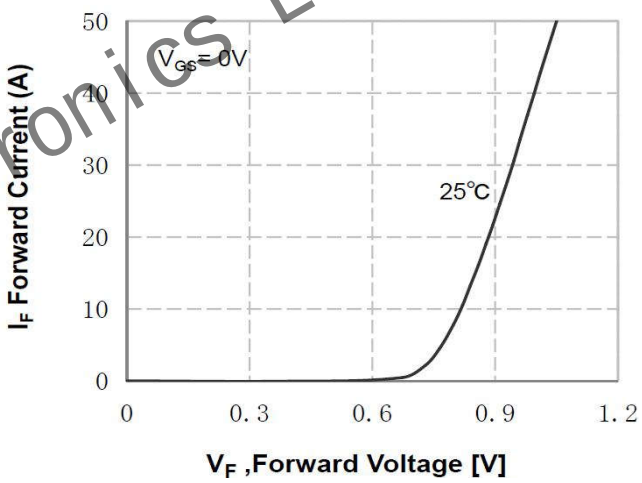
Output Characteristics



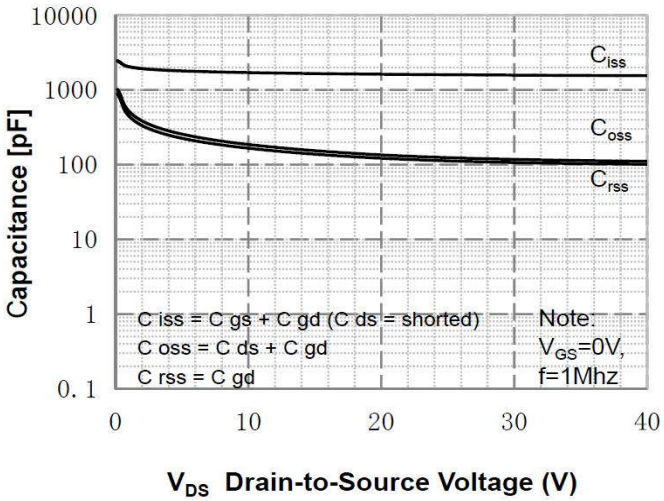
Transfer Characteristics



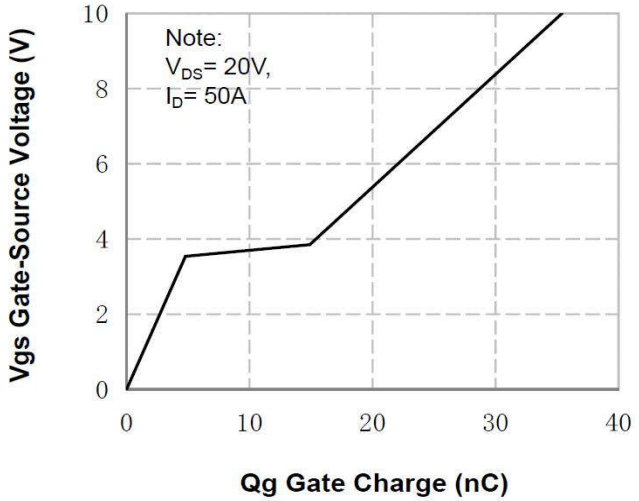
$R_{DS(ON)}$——I_D



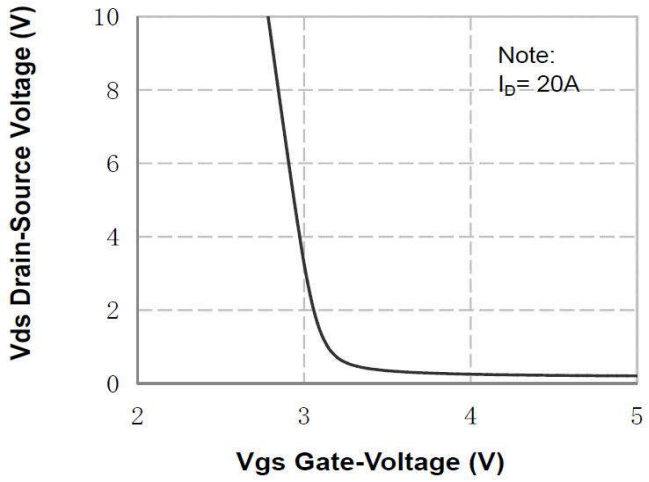
Body-Diode Characteristics



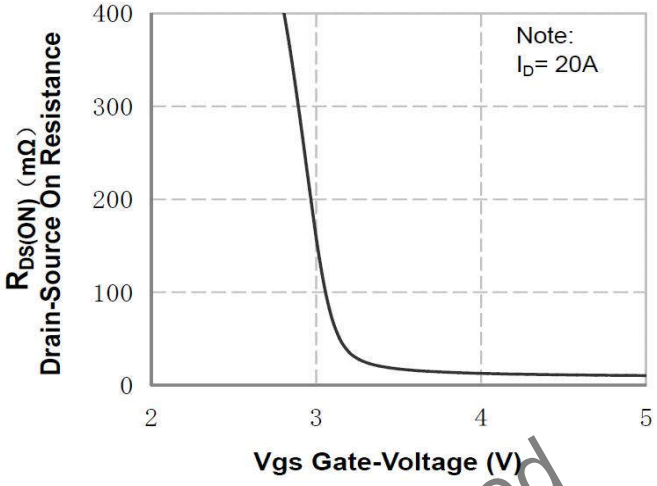
Capacitance Characteristics



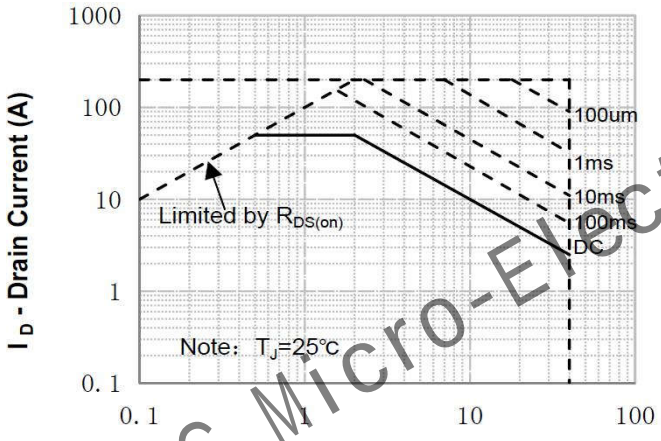
Gate Charge Characteristics



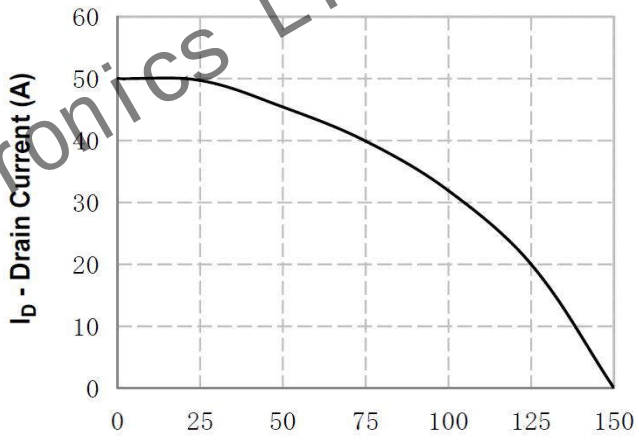
Vds Drain-Source Voltage vs Gate Voltage



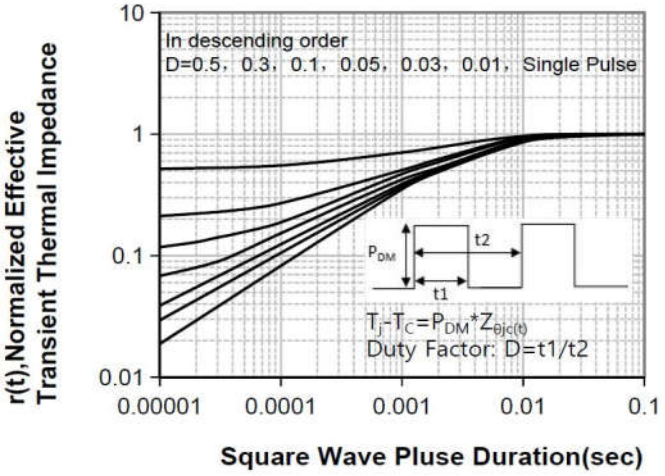
On-Resistance vs Gate Voltage



Maximum Safe Operating Area

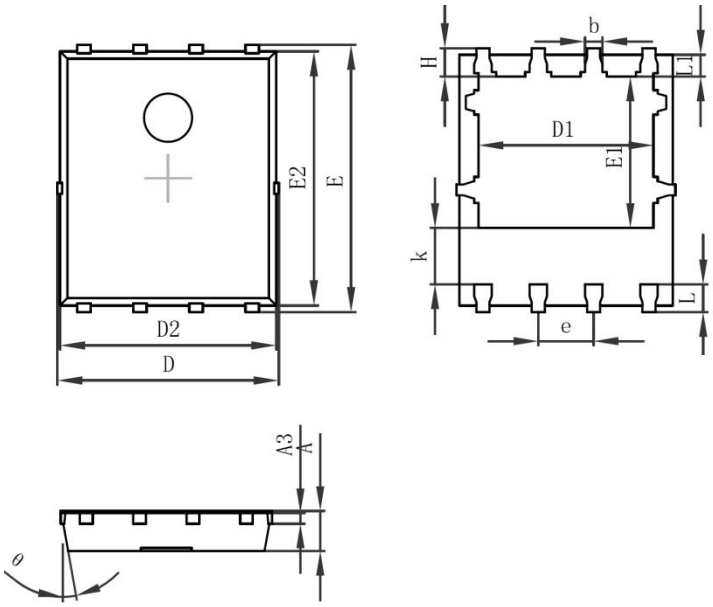


Current De-rating



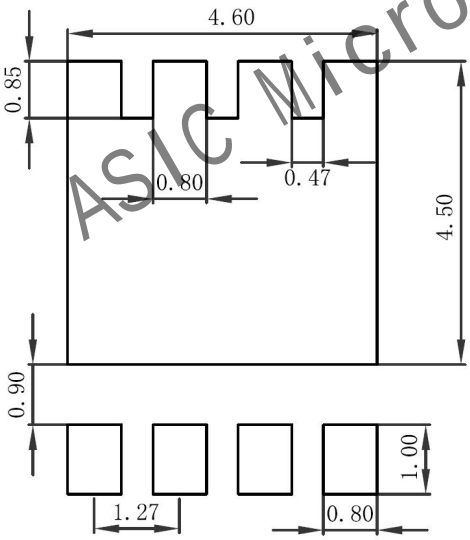
Transient Thermal Response Curve

7.Dimension



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°

8.Recommended Land Pattern

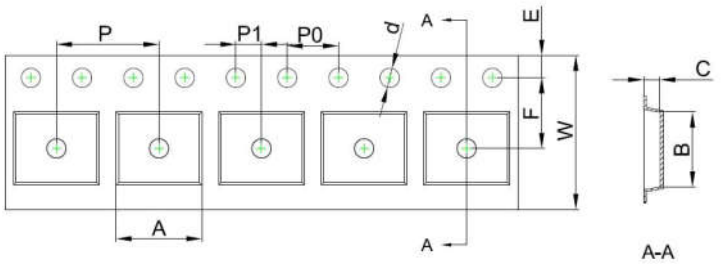


Note:

1. Controlling dimension: in millimeters
2. General tolerance: ±0.05mm
3. The pad layout is for reference only
4. Unit: mm

9.Tape and Reel

PDFN5*6-8L Embossed Carrier Tape

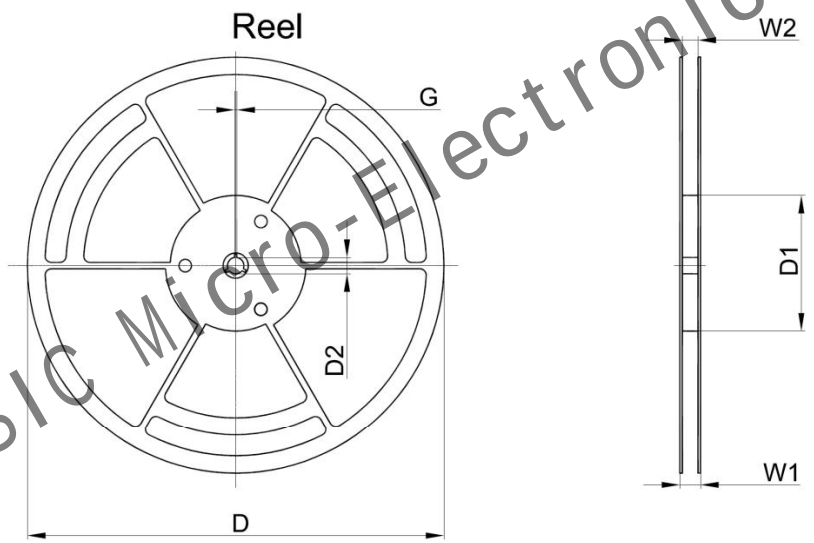


Packaging Description:

PDFNWB5×6-8L 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 5,000 units per 13" or 33.0 cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
PDFNWB5×6-8L	6.30	5.30	1.10	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

PDFN5*6-8L Reel



Dimensions are in millimeter						
Reel Option	D	D1	D2	G	W1	W2
13"Dia	Ø330.00	100.00	13.00	1.90	17.60	12.40

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)
5,000 pcs	13 inch	5,000 pcs	340×336×29	50,000 pcs	353×346×365

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