

-40V P-Channel MOSFET

1.Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-40V	10.5mΩ@-10V	-40A
	14mΩ@-4.5V	

2.Features

- V_{DS} -40V
- I_D -40A
- $R_{DS(ON)}$ (at $V_{GS}=-10V$) <14 mohm
- $R_{DS(ON)}$ (at $V_{GS}=-4.5V$) <17.5 mohm
- Very Low On-resistance $R_{DS(ON)}$
- Low C_{rss}
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

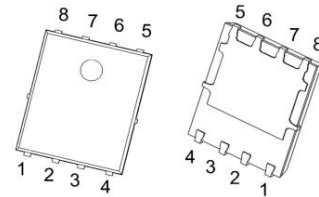
3.Applications

- PWM Application
- Load Switch
- Power Management

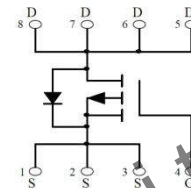
4.Absolute Maximum rating ($T_A = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain - Source Voltage	V_{DS}	-40	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	-40	A
Pulsed Drain Current ¹	I_{DM}	-160	A
Single Pulsed Avalanche Energy ²	E_{AS}	210	mJ
Power Dissipation	P_D	40	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	3.12	°C/W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-55~ +150	°C

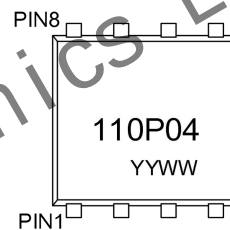
PDFN5*6-8L



Schematic diagram



Marking



110P04 : Device Code
YY : Year Code
WW : Week Code

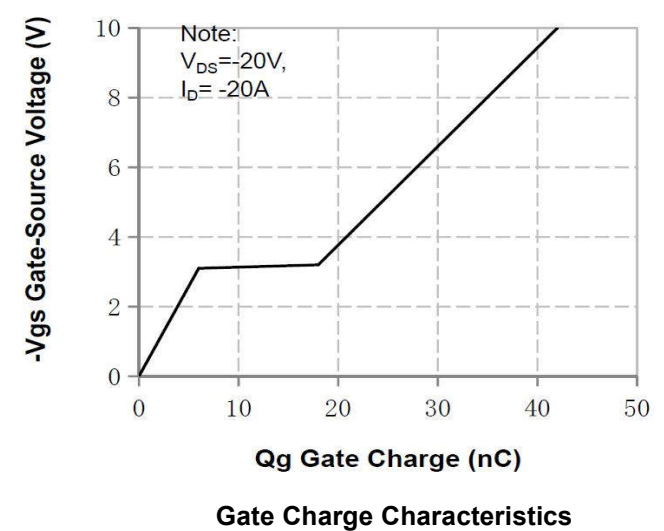
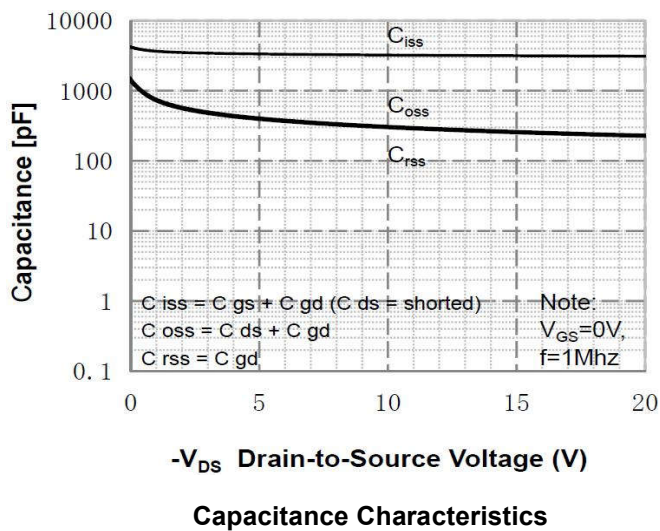
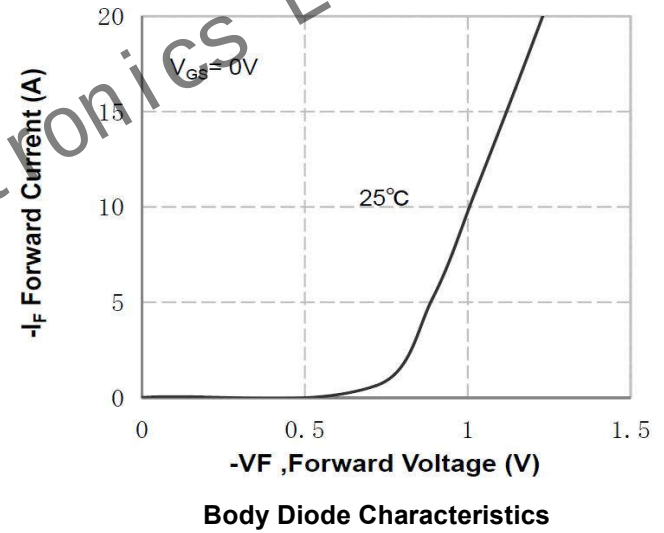
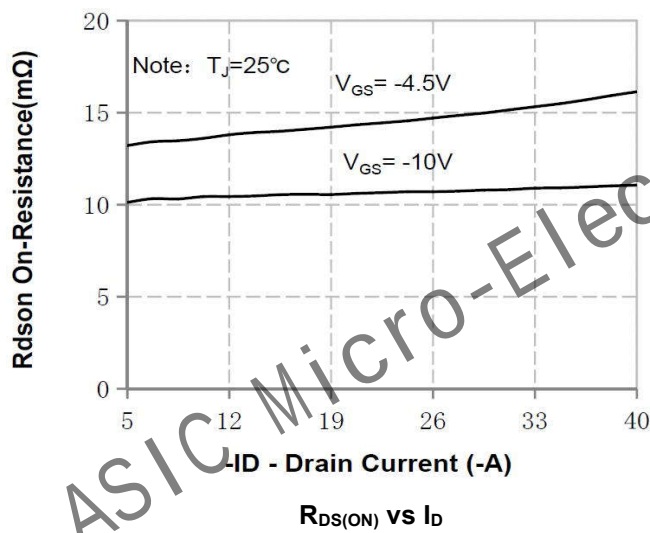
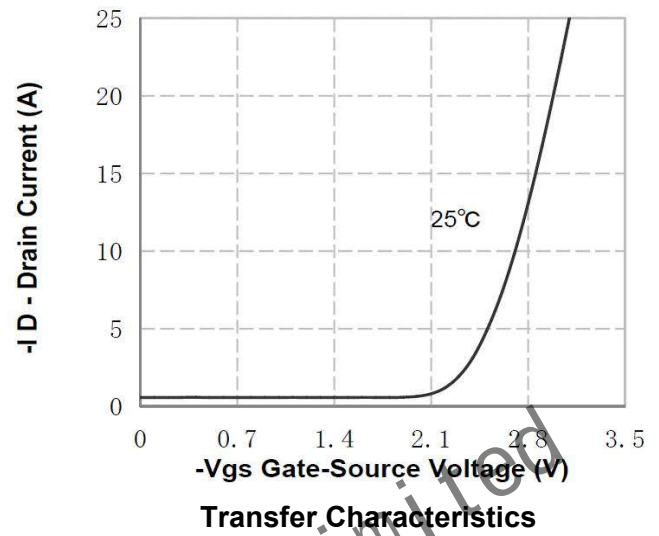
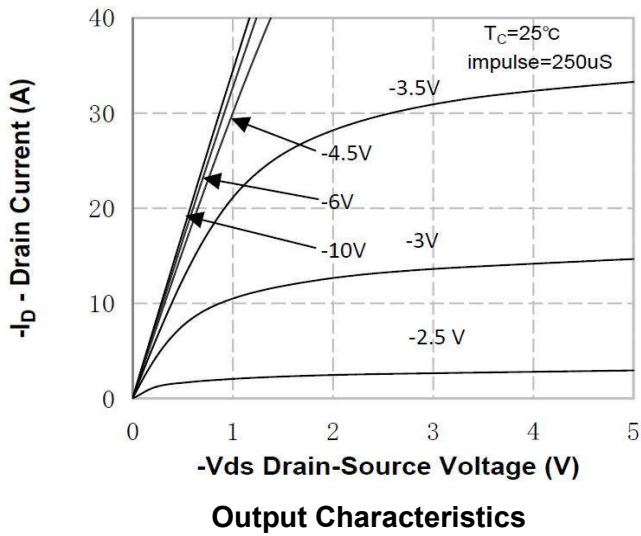
5. Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

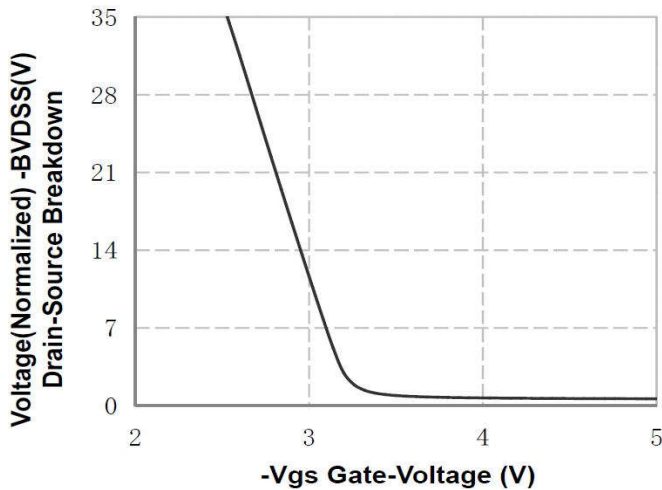
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-40			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -40V, V_{GS} = 0V$			1	μA
Gate - Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.0	-1.6	-2.5	V
Drain-source On-resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -20A$		10.5	14	m Ω
		$V_{GS} = -4.5V, I_D = -20A$		14.0	17.5	
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = -20V, V_{GS} = 0V,$ $f = 1MHz$		3120		pF
Output Capacitance	C_{oss}			238		
Reverse Transfer Capacitance	C_{rss}			226		
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS} = -20V, V_{GS} = -10V,$ $I_D = -20A$		42		nC
Gate-source Charge	Q_{gs}			7.0		
Gate-drain Charge	Q_{gd}			8.2		
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = -20V, V_{GS} = -10V,$ $R_G = 3\Omega, I_D = -20A$		14		ns
Turn-on Rise Time	t_r			16		
Turn-off Delay Time	$t_{d(off)}$			36		
Turn-off Fall Time	t_f			18		
Source - Drain Diode Characteristics						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = -20A$			-1.2	V

Notes :

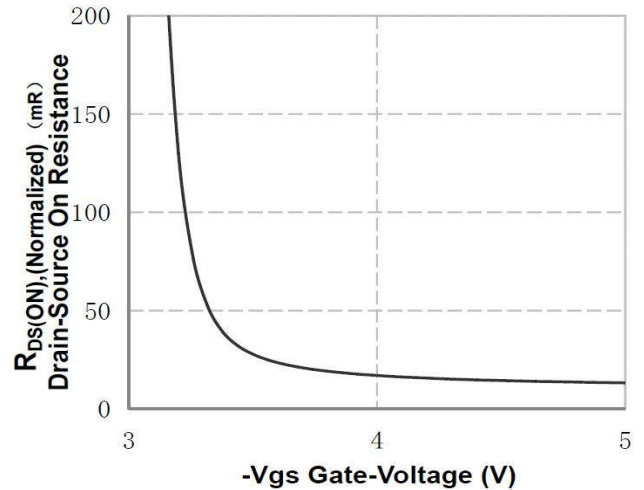
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: $T_J = 25^\circ\text{C}$, $V_{DD} = -20V$, $V_G = -10V$, $R_G = 25\Omega$, $L = 0.5\text{mH}$.

6. Typical Characteristic

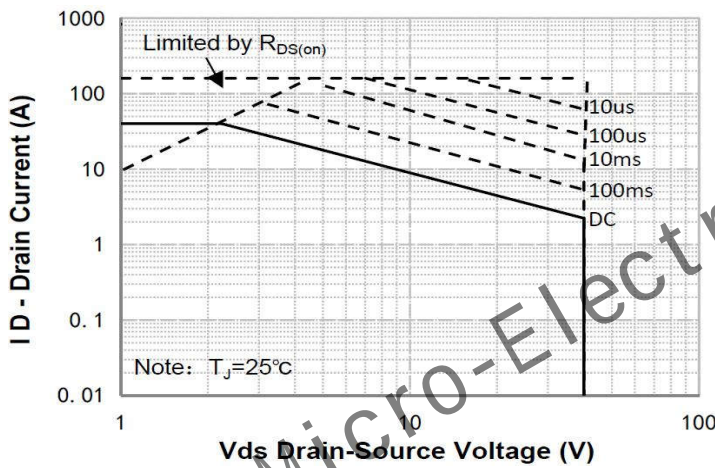




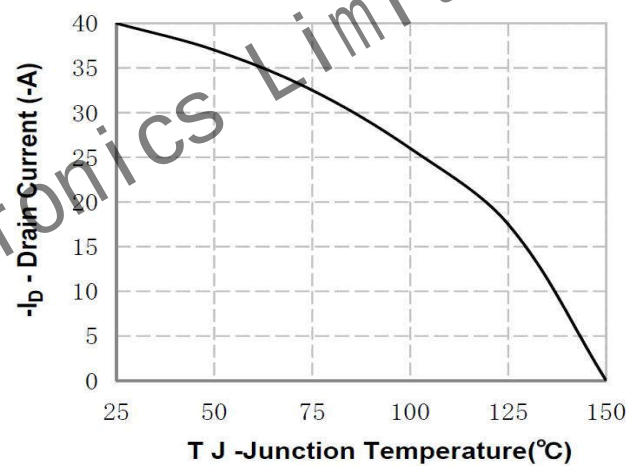
Breakdown Voltage Variation vs Gate-Voltage



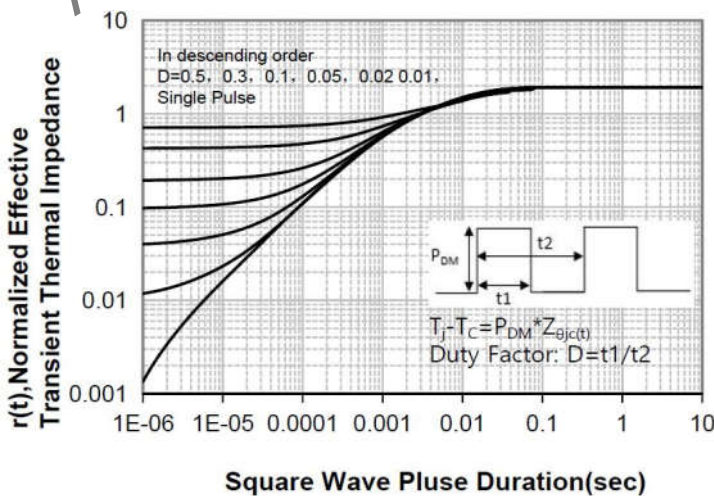
On-Resistance Variation vs Gate Voltage



Maximum Safe Operating Area

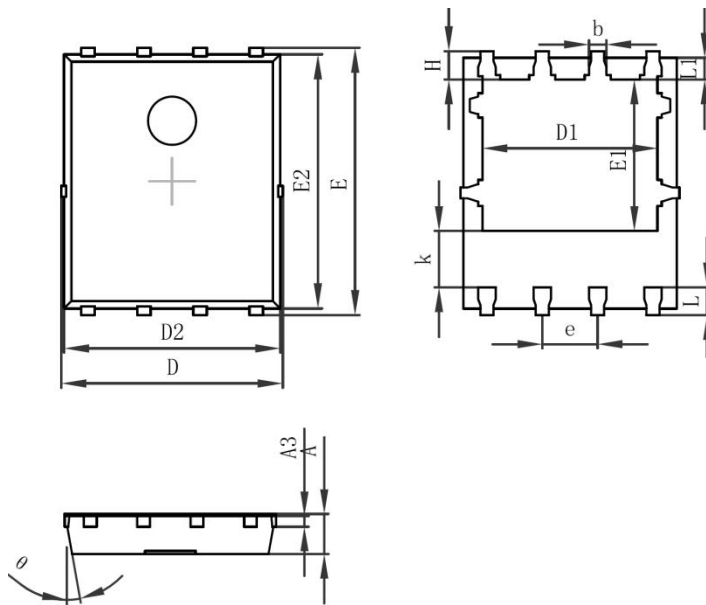


Maximum Continuous Drain Current vs. Case Temperature



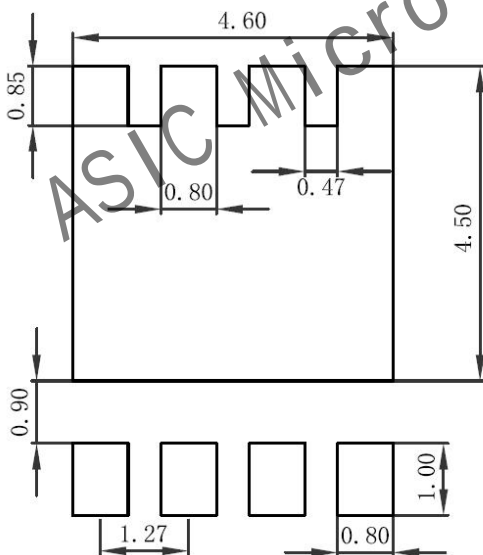
Maximum Effective Transient Thermal Impedance, Junction-to-Case

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

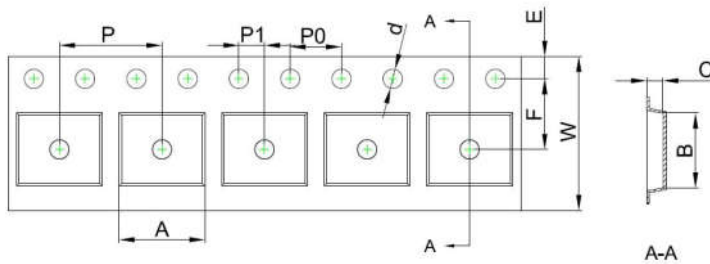


Note:

1. Controlling dimension: in millimeters
2. General tolerance: $\pm 0.05\text{mm}$
3. The pad layout is for reference only
4. Unit: mm

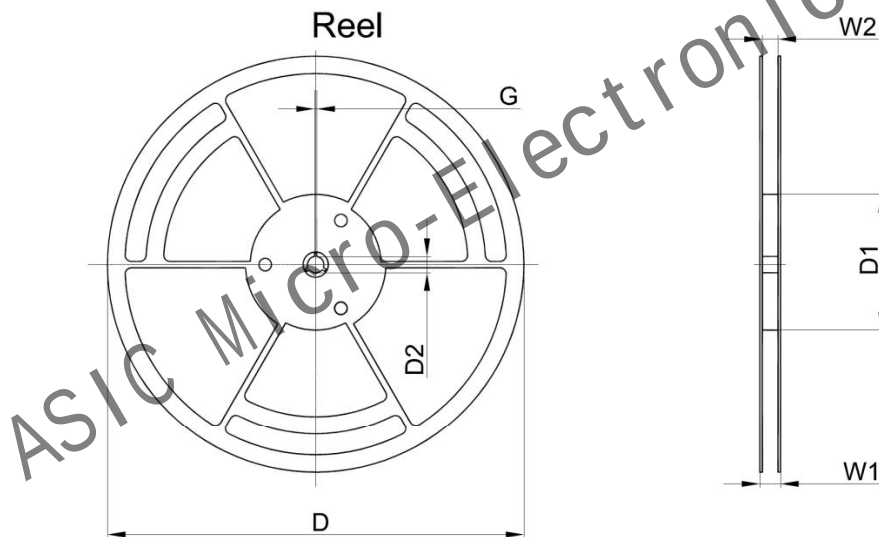
9. Tape and Reel

PDFN5*6-8L Embossed Carrier Tape



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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