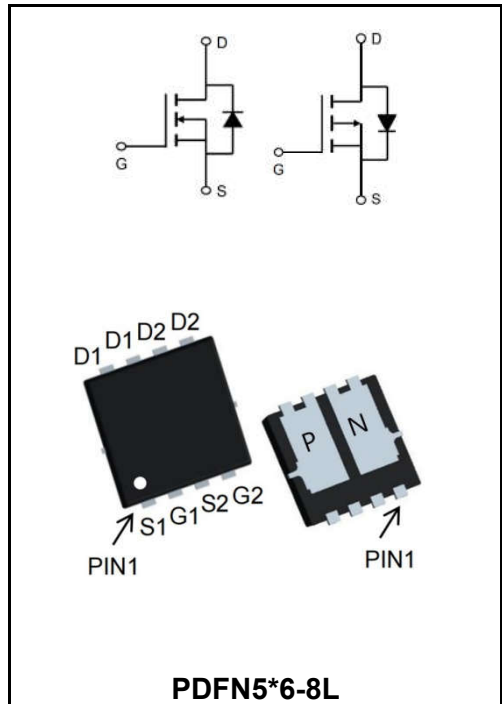


20V N+P-CHANNEL ENHANCEMENT MODE MOSFET
MAIN CHARACTERISTICS

I_D	32A
V_{DSS}	20V
$R_{DS(on)-typ}(@V_{GS}=4.5V)$	< 10mΩ (Type: 7.7 mΩ)
I_D	-26.8A
V_{DSS}	-20V
$R_{DS(on)-typ}(@V_{GS}=-4.5V)$	< 20mΩ (Type: 16.8 mΩ)


Application

- ◆ Wireless charging
- ◆ Boost driver
- ◆ Brushless motor

Product Specification Classification

Part Number	Package	Marking	Pack
YFW25G02NF	PDFN5*6-8L	YFW 25G02NF XXXXX	5000PCS/Tape

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value		Units
		N-Ch	P-Ch	
Drain-Source Voltage	VDS	20	-20	V
Gate - Source Voltage	VGS	±20	±20	V
Continuous Drain Current, $V_{GS} @ 10V^1 @ T_C=25^\circ C$	I_D	32	26.8	A
Continuous Drain Current, $V_{GS} @ 10V^1 @ T_C=100^\circ C$	I_D	27.4	-22.5	A
Pulsed Drain Current ²	I_{DM}	78	-69.1	A
Single Pulse Avalanche Energy ³	E_{AS}	150	135	mJ
Avalanche Current	I_{AS}	72	68	A
Total Power Dissipation ⁴ @ $T_C=25^\circ C$	P_D	46	41.3	W
Storage Temperature Range	T_{STG}	-55 to +150	-55 to +150	°C
Operating Junction Temperature Range	T_J	-55 to +150	-55 to +150	°C
Thermal Resistance Junction-Ambient ¹	R_{θJA}	62		°C/W
Thermal Resistance Junction-Case ¹	R_{θJC}	5		°C/W

N-Channel Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	V(BR)DSS	20	23	-	V
Zero Gate Voltage Drain Current	V _{DS} =20V, V _{GS} =0V	I_{DSS}	-	-	1.0	μA
Gate to Body Leakage Current	V _{GS} =±12V, V _{DS} =0V	I_{GSS}	-	-	±100	nA
Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	V_{GS(th)}	0.58	0.65	1.2	V
Static Drain-Source On-Resistance note3	V _{GS} =4.5V, I _D =25A	R_{DS(ON)}	-	7.7	10	mΩ
	V _{GS} =2.5V, I _D =10A		-	10	13	mΩ
Input Capacitance	V _{DS} =10V V _{GS} =0V f=1.0MHz	C_{iss}	-	1458	-	pF
Output Capacitance		C_{oss}	-	238	-	
Reverse Transfer Capacitance		C_{rss}	-	212	-	
Total Gate Charge	V _{DS} =10V I _D =25A V _{GS} =4.5V	Q_g	-	19	-	nC
Gate-Source Charge		Q_{gs}	-	3	-	
Gate-Drain("Miller") Charge		Q_{gd}	-	6.4	-	
Turn-on delay time	V _{DS} =10V I _D = 10A R _{GEN} = 3Ω V _{GS} =4.5V	t_{d(on)}	-	10	-	ns
Turn-on Rise Time		T_r	-	21	-	
Turn-Off Delay Time		t_{d(OFF)}	-	39	-	
Turn- Off Fall Time		t_f	-	19	-	
Maximum Continuous Drain to Source Diode Forward Current		I_S	-	-	50	A
Maximum Pulsed Drain to Source Diode Forward Current		I_{SM}	-	-	200	A
Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =30A	V_{SD}	-	-	1.2	V
Body Diode Reverse Recovery Time	I _F =20A, dI/dt=100A/μs	t_{rr}	-	25	-	ns
Body Diode Reverse Recovery Charge		Q_{rr}	-	20	-	nC

Note :

- 1、 The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2、 The data tested by pulsed , pulse width ≅ 300us , duty cycle ≅ 2%
- 3、 The EAS data shows Max. rating . The test condition is V_{DD}=16V, V_{GS}=10V, L=0.1mH, I_{AS}=21A
- 4、 The power dissipation is limited by 150°C junction temperature
- 5、 The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

P-Channel Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	V(BR)DSS	-20	-22	-	V
Zero Gate Voltage Drain Current	V _{DS} =-20V, V _{GS} =0V	I_{DSS}	-	-	-1	μA
Gate to Body Leakage Current	V _{GS} =±12V, V _{DS} =0V	I_{GSS}	-	-	±100	nA
Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250uA	V_{GS(th)}	-0.58	-0.7	-1.2	V
Static Drain-Source On-Resistance note2	V _{GS} =-4.5V, I _D =-10A	R_{DS(ON)}	-	16.8	20	mΩ
	V _{GS} =-2.5V, I _D =-5A		-	21.5	25	mΩ
Input Capacitance	V _{DS} =-10V V _{GS} =0V f=1.0MHz	C_{iss}	-	2000	-	pF
Output Capacitance		C_{oss}	-	242	-	
Reverse Transfer Capacitance		C_{rss}	-	231	-	
Total Gate Charge	V _{DS} =-10V I _D =-6A V _{GS} =-4.5V	Q_g	-	15.3	-	nC
Gate-Source Charge		Q_{gs}	-	2.2	-	
Gate-Drain("Miller") Charge		Q_{gd}	-	4.4	-	
Turn-on delay time	V _{DS} =-10V I _D = -12A R _{GEN} = 2.5Ω V _{GS} =-4.5V	t_{d(on)}	-	10	-	ns
Turn-on Rise Time		T_r	-	31	-	
Turn-Off Delay Time		t_{d(OFF)}	-	28	-	
Turn- Off Fall Time		t_f	-	8	-	
Maximum Continuous Drain to Source Diode Forward Current		I_S	-	-	-12	A
Maximum Pulsed Drain to Source Diode Forward Current		I_{SM}	-	-	-48	A
Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =-12A	V_{SD}	-	-0.8	-1.2	V

Note :

- 1、 The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2、 The data tested by pulsed , pulse width ≅ 300us , duty cycle ≅ 2%
- 3、 The EAS data shows Max. rating . The test condition is V_{DD}=-16V, V_{GS}=-10V, L=0.1mH, I_{AS}=-21A
- 4、 The power dissipation is limited by 150°C junction temperature
- 5、 The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Ratings and Characteristic Curves

N-Typical Characteristics

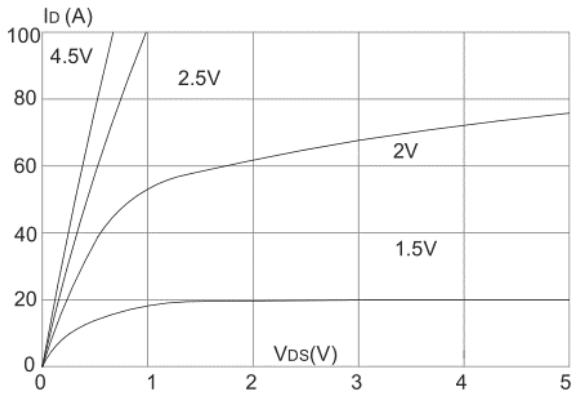


Figure 1: Output Characteristics

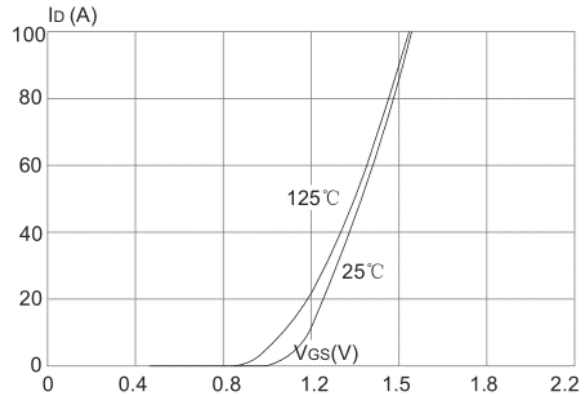


Figure 2: Typical Transfer Characteristics

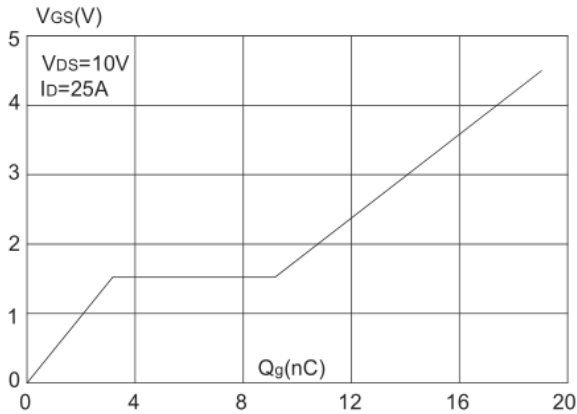


Figure 3: On-resistance vs. Drain Current

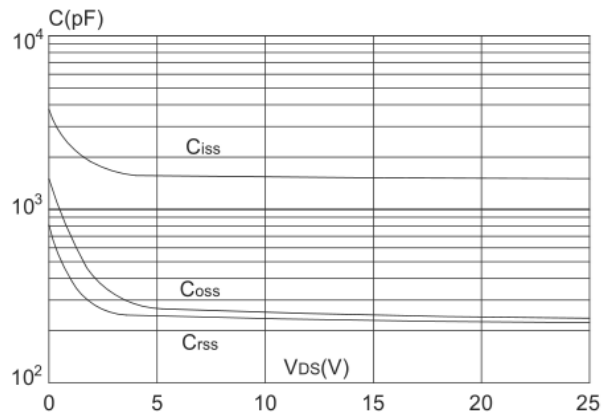


Figure 4: Body Diode Characteristics

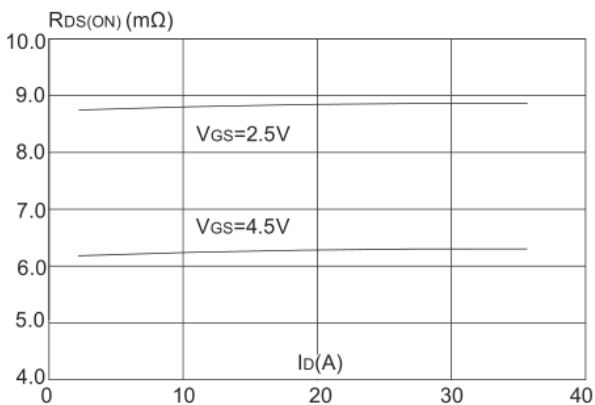


Figure 5: Gate Charge Characteristics

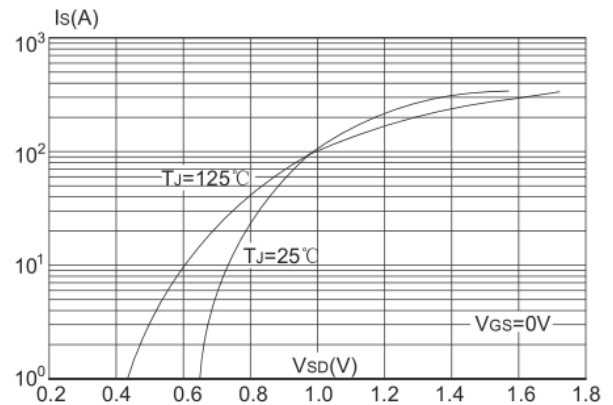


Figure 6: Capacitance Characteristics

Ratings and Characteristic Curves

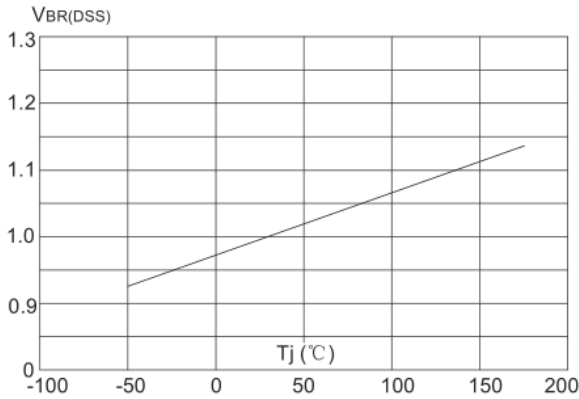


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

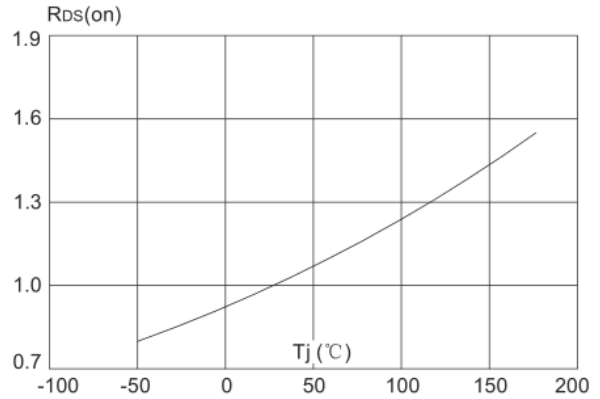


Figure 8: Normalized on Resistance vs. Junction Temperature

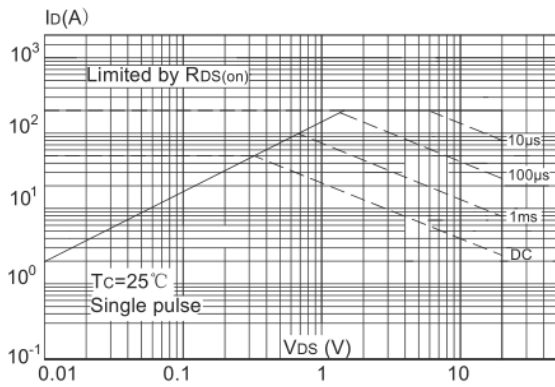


Figure 9: Maximum Safe Operating Area

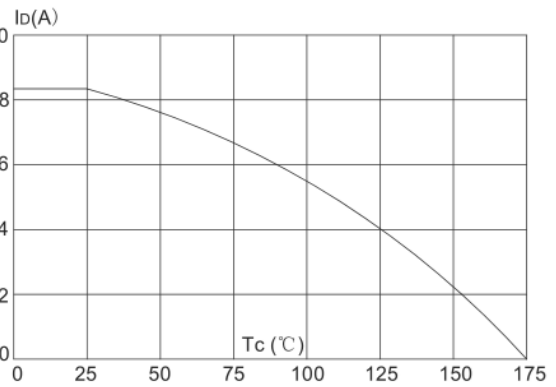


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

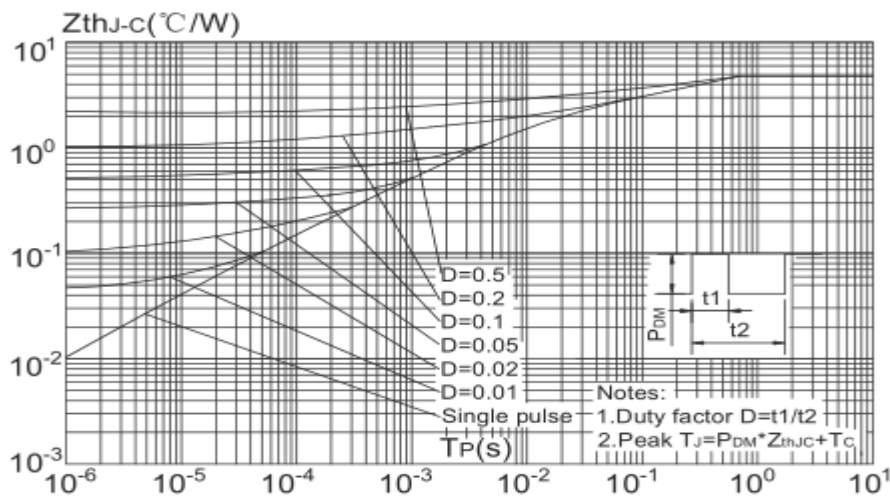


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

P-Typical Characteristics

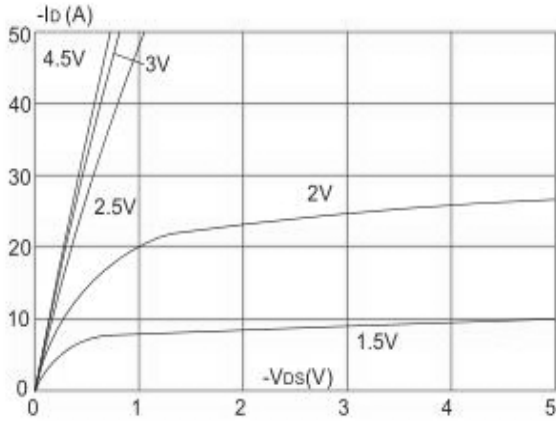


Figure 1: Output Characteristics

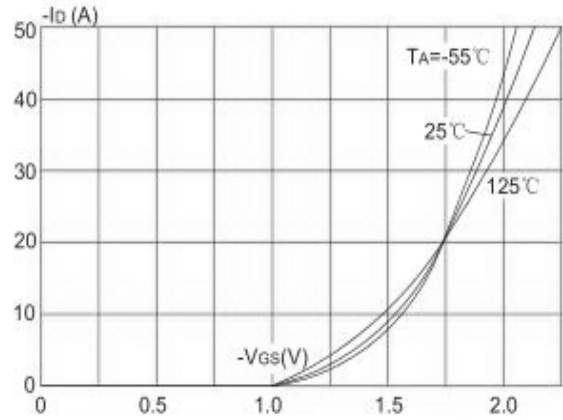


Figure 2: Typical Transfer Characteristics

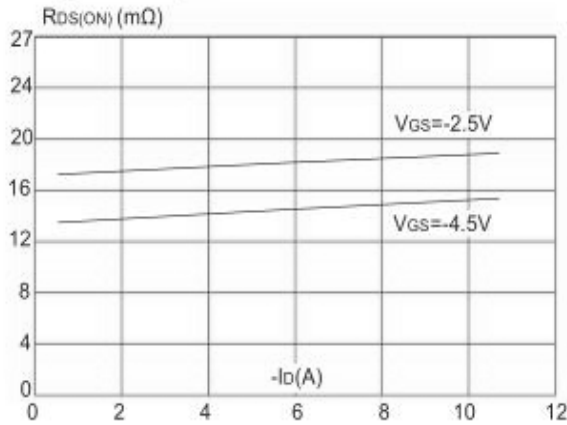


Figure 3: On-resistance vs. Drain Current

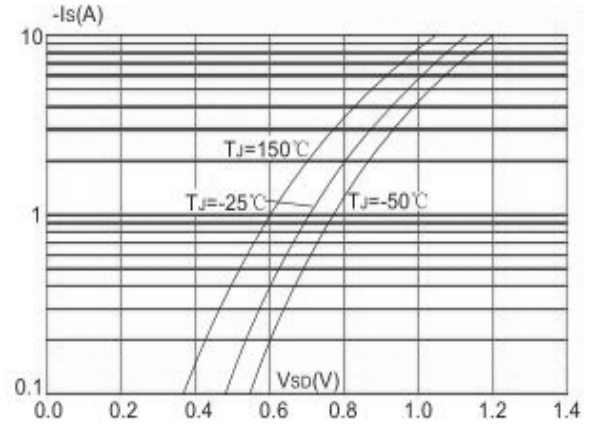


Figure 4: Body Diode Characteristics

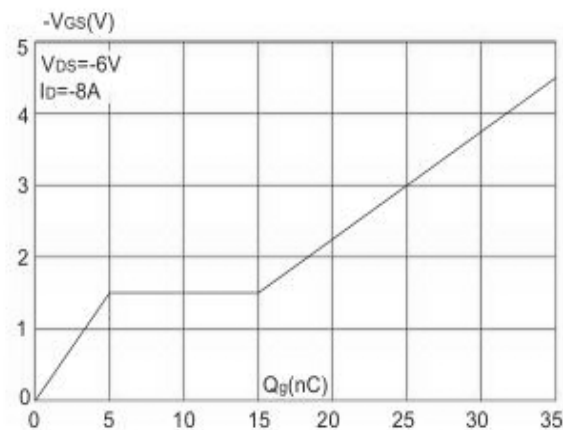


Figure 5: Gate Charge Characteristics

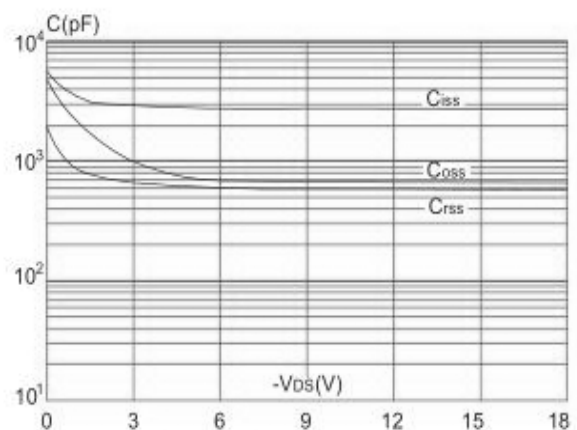


Figure 6: Capacitance Characteristics

Ratings and Characteristic Curves

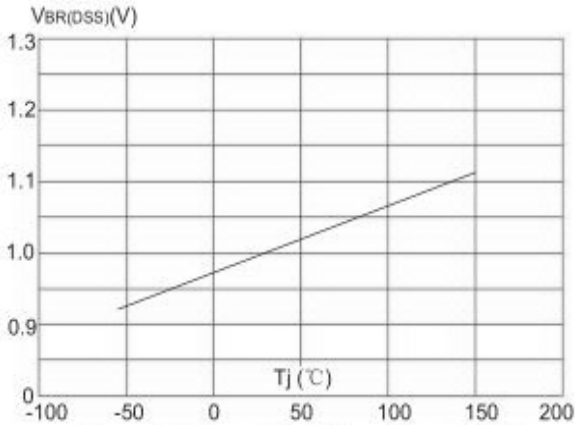


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

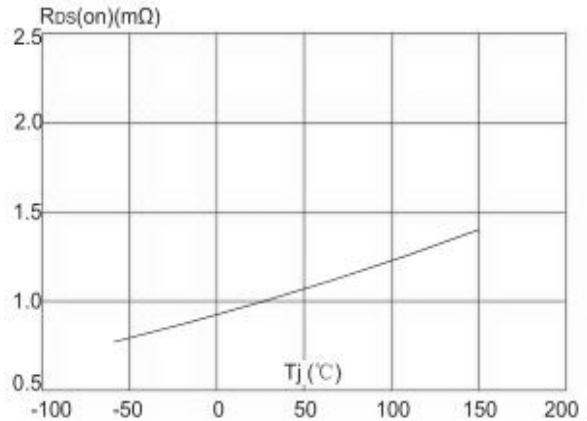


Figure 8: Normalized on Resistance vs. Junction Temperature

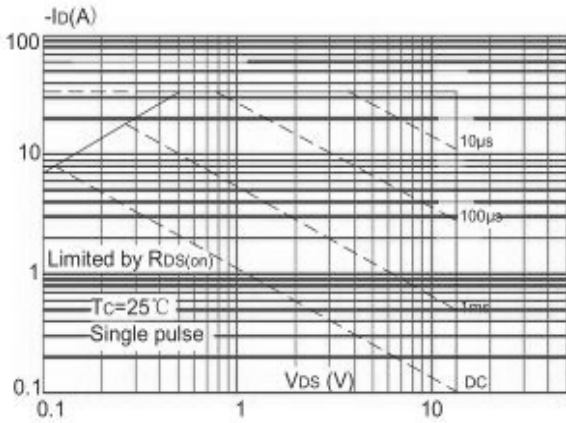


Figure 9: Maximum Safe Operating Area

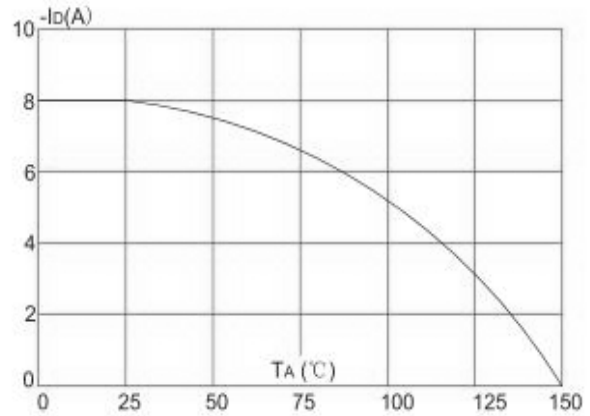


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

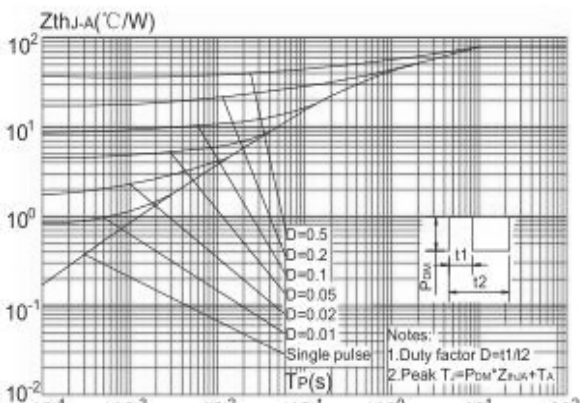
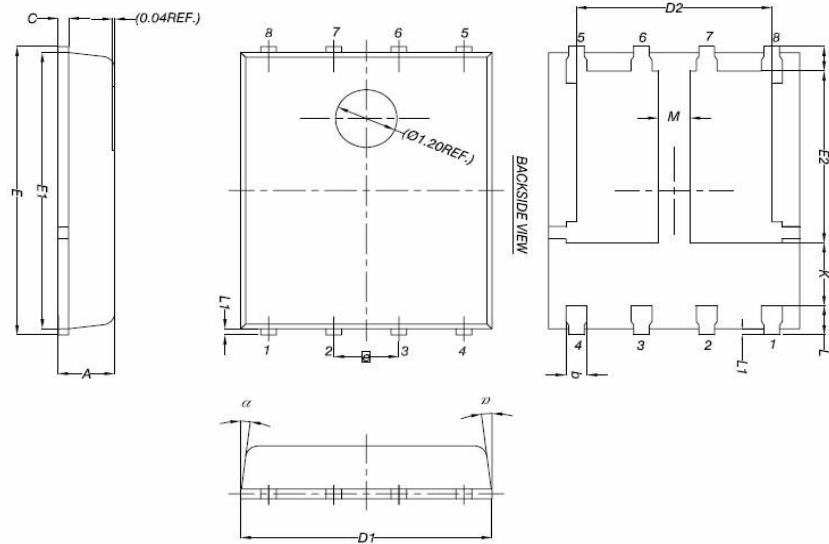


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

PDFN5*6-8L



Symbol	Common		
	mm		
	Mim	Nom	Max
A	0.90	1.00	1.10
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.66	5.76	5.83
E2	3.37	3.47	3.58
e	1.27BSC		
H	0.41	0.51	0.61
K	1.10	--	--
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
M	0.50	--	--
a	0°	--	12°