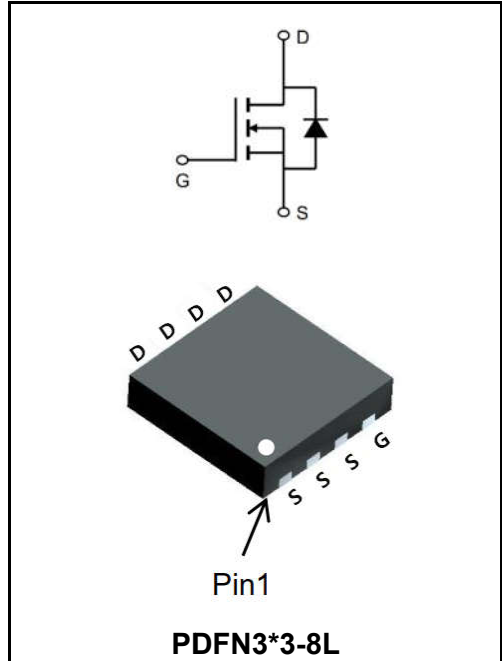


20V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	20A
V_{DSS}	20V
$R_{DS(on)-typ}(@V_{GS}=10V)$	< 8.0mΩ (Type:6.1 mΩ)



Application

- ◆ Battery protection
- ◆ Load switch
- ◆ Uninterruptible power supply

Product Specification Classification

Part Number	Package	Marking	Pack
YFW20N02DF	PDFN3*3-8L	YFW 20N02DF XXXXX	5000PCS/Tape

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	20	V
Gate - Source Voltage	V_{GS}	±12	V
Continuous Drain Current T _c =25°C	I_D	20	A
Continuous Drain Current T _c =100°C	I_D	15	A
Pulsed Drain Current ^{note1}	I_{DM}	60	A
Single Pulse Avalanche Energy ^{note2}	E_{AS}	36	mJ
Total Power Dissipation T _c =25°C	P_D	31	W
Thermal Resistance, Junction to Case	$R_{θJC}$	4.84	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	V(BR)DSS	20	22	-	V
Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V$	I_{DSS}	-	-	1.0	μA
Gate to Body Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	I_{GSS}	-	-	±100	nA
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	V_{GS(th)}	0.4	0.7	1.1	V
Static Drain-Source On-Resistance note3	$V_{GS}=4.5V, I_D=25A$	R_{DS(ON)}	-	6.1	8.0	mΩ
	$V_{GS}=2.5V, I_D=10A$		-	8.8	13	
Input Capacitance	$V_{DS}=10V$ $V_{GS}=0V$ $f=1.0MHz$	C_{iss}	-	1458	-	μF
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	$V_{DS}=10V$ $I_D=10A$ $R_{GEN}=3\Omega$ $V_{GS}=4.5V$	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	$I_F=20A, di/dt=100A/\mu s$	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 .The EAS data shows Max. rating .
- 3、 The EAS condition: T_J=25°C, V_{DD}=16V, V_G=10V, R_G=0.6Ω, L=0.5mH, I_{AS}=33A
- 4、 The power dissipation is limited by 175°C junction temperature
- 5、 The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Ratings and Characteristic Curves

Typical Characteristics

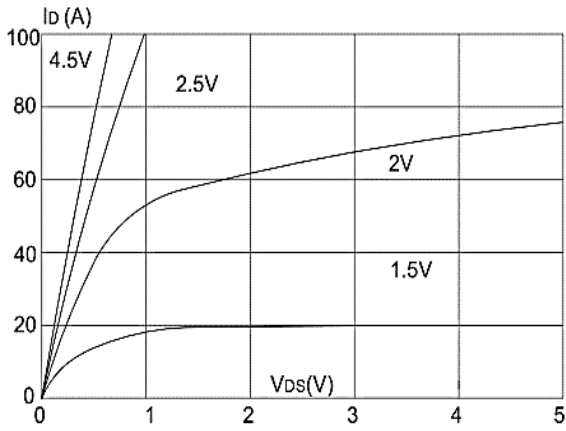


Figure1: Output Characteristics

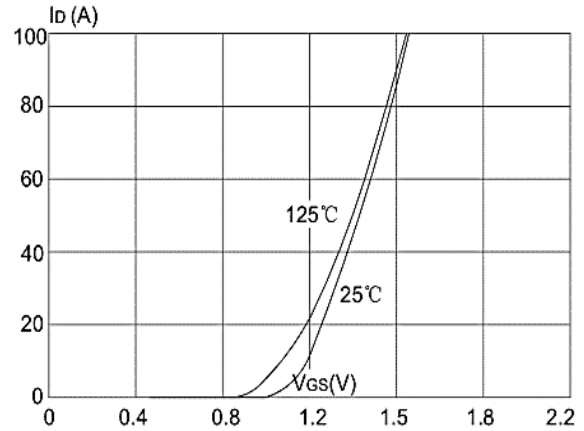


Figure 2: Typical Transfer Characteristics

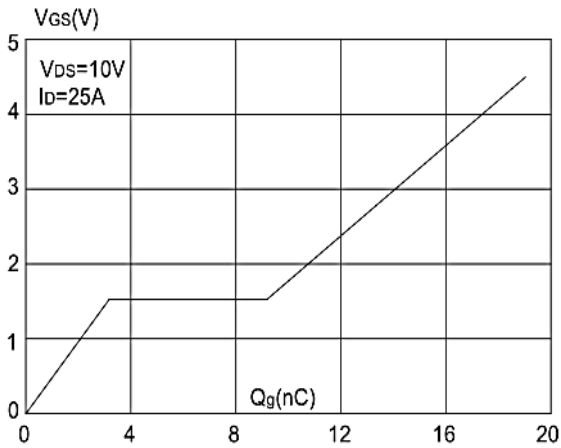


Figure 3: On-resistance vs. Drain Current

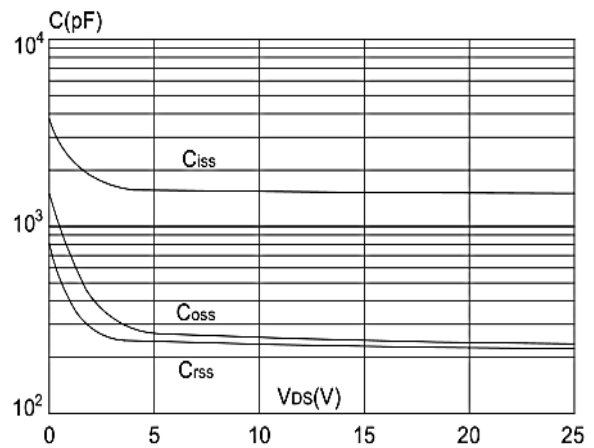


Figure 4: Body Diode Characteristics

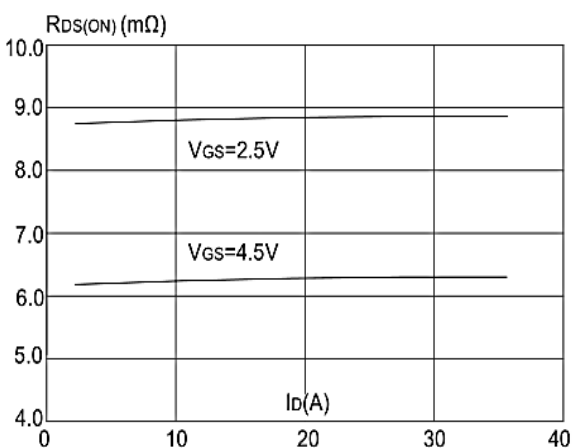


Figure 5: Gate Charge Characteristics

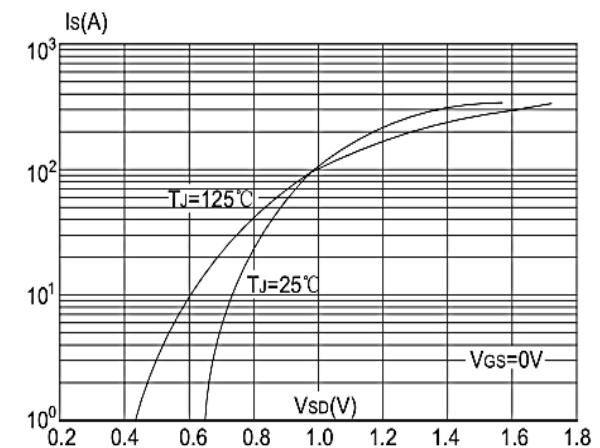


Figure 6: Capacitance Characteristics

Ratings and Characteristic Curves

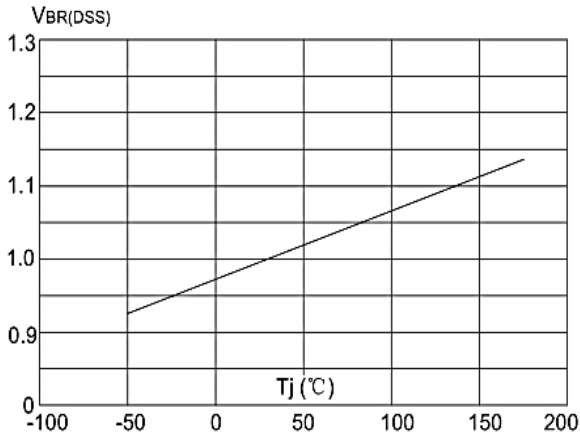


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

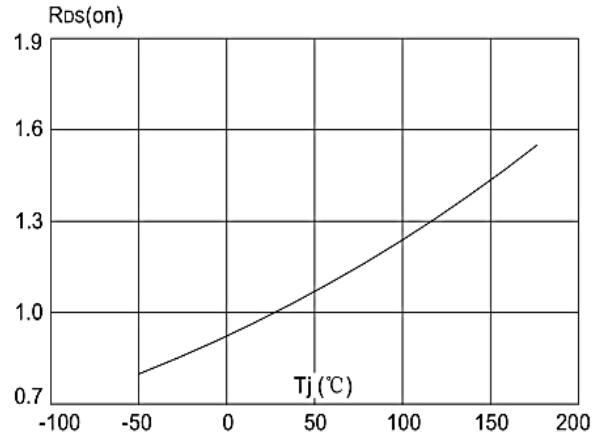


Figure 8: Normalized on Resistance vs. Junction Temperature

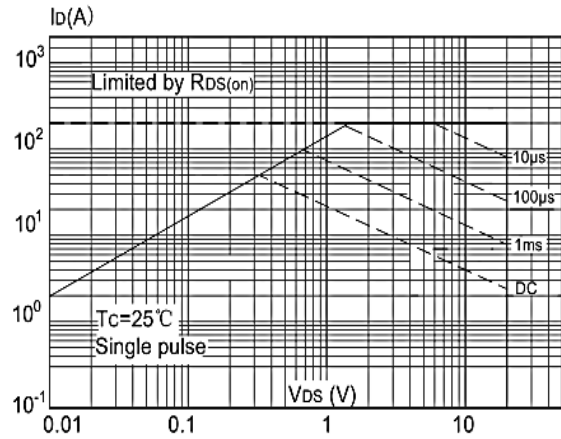


Figure 9: Maximum Safe Operating Area

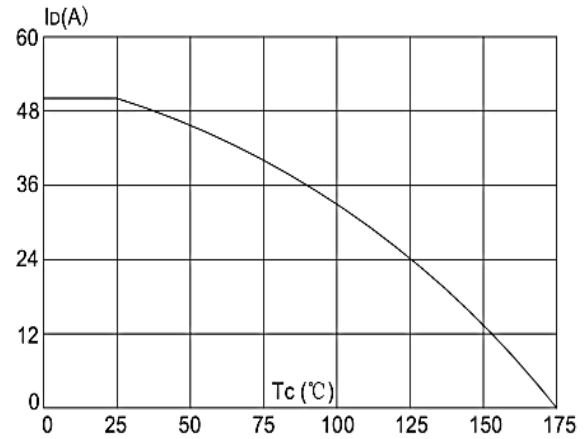


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

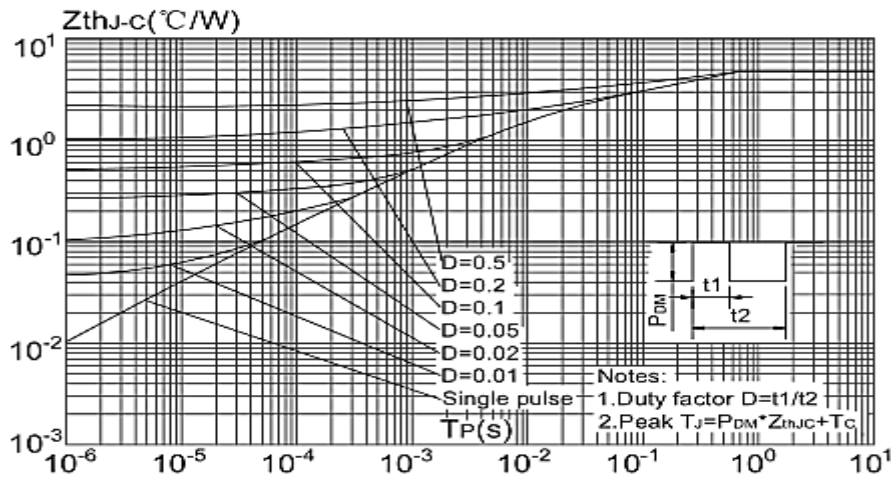
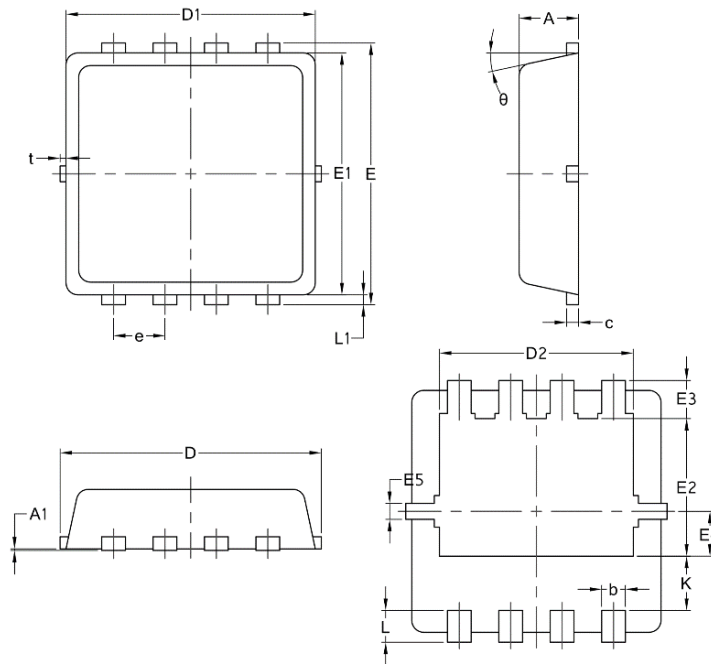


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

PDFN3*3-8L



Symbol	Common		
	mm		
	Min	Nom	Max
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.20	0.30	0.40
c	0.10	0.152	0.25
D	3.15	3.30	3.45
D1	3.00	3.15	3.25
D2	2.29	2.45	2.65
E	3.15	3.30	3.45
E1	2.90	3.05	3.20
E2	1.54	1.74	1.94
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	0.59	0.69	0.89
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
t	0	0.075	0.13
Φ	10	12	14