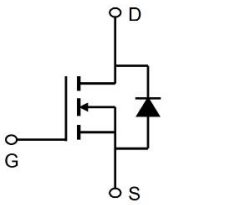
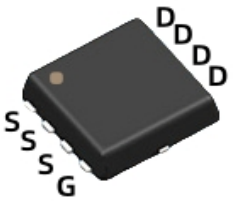
100V N-Channel Enhancement Mode MOSFET

MAIN CHARACTERISTICS

I_D	20A
V_{DSS}	100V
R_{DSON}-typ(@V_{GS}=10V)	<40mΩ(Typ:33mΩ)
R_{DSON}-typ(@V_{GS}=4.5V)	<45mΩ(Typ:35mΩ)





PDFN3*3-8L

Description

The YFW20N10DF uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

Applications

- Automative lighting
- Load switch
- Uninterruptible power supply

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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current, V_{GS} @ 10V @T_C=25℃	I_D	20	A
Drain Current, V_{GS} @ 10V @T_C=100℃	I_D	12	A
Pulsed Drain Current[1]	I_{DM}	80	A
Total Power Dissipation @T_C=25℃	P_D	42	W
Total Power Dissipation[3]@T_A=25℃	P_D	1.7	W
Storage Temperature Range	T_{STG}	-55 to 150	℃
Operating Junction Temperature Range	T_J	-55 to 150	℃
Maximum Thermal Resistance, Junctionambient	$R_{\theta JA}$	25	℃/W
Maximum Thermal Resistance, Junction-case	$R_{\theta JC}$	3.6	℃/W

Electrical Characteristics@Tj=25℃(unless otherwise specified)

Parameter	Test Condition	Symbol	Min.	Typ.	Max.	Units
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	BV_{DSS}	100	107	-	V
Zero Gate Voltage Drain Current	V_{DS}=100V, V_{GS}=0V,	I_{DSS}	-	-	1.0	μA
Gate to Body Leakage Current	V_{DS}=0V, V_{GS}=±20V	I_{GSS}	-	-	±100	nA
Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	$V_{GS(th)}$	1.0	1.5	2.0	V
Static Drain-Source on-Resistance	V_{GS}=10V, I_D=10A	$R_{DS(on)}$	-	33	40	mΩ
	V_{GS}=4.5V, I_D=6A		-	35	45	mΩ
Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	C_{iss}	-	1964	-	pF
Output Capacitance		C_{oss}	-	90	-	pF
Reverse Transfer Capacitance		C_{rss}	-	74	-	pF
Total Gate Charge	V_{DS}=80V, I_D=20A, V_{GS}=4.5V	Q_G	-	20	-	nC
Gate-Source Charge		Q_{GS}	-	3.1	-	nC
Gate-Drain("Miller") Charge		Q_{GD}	-	14	-	nC
Turn-on Delay Time	V_{DS}=80V, I_D=20A, R_G=3.1Ω, V_{GS}=4.5V	$t_{d(ON)}$	-	11	-	ns
Turn-on Rise Time		t_r	-	91	-	ns
Turn-off Delay Time		$t_{d(OFF)}$	-	40	-	ns
Turn-off Fall Time		t_f	-	71	-	ns
Maximum Continuous Drain to Source Diode Forward Current		I_S	-	-	30	A
Maximum Pulsed Drain to Source Diode Forward Current		I_{SM}	-	-	80	A
Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=20A	V_{SD}	-	-	1.2	V
Body Diode Reverse Recovery Time	I_F=20A, dI/dt=100A/μs	trr	-	64	-	ns
Body Diode Reverse Recovery Charge		Qrr	-	152	-	nC

Note :

1、The data tested by surface mounted on a 1 inch 2 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 VDD=72V,VGS=10V,L=0.1mH,IAS=10A

4、The power dissipation is limited by 150℃ 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.

Typical Characteristics

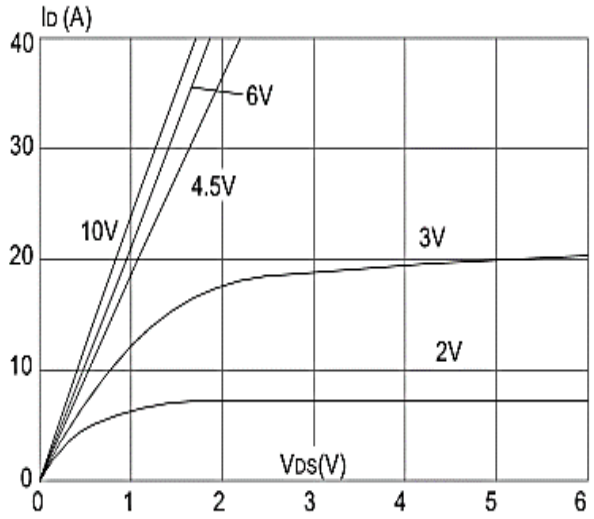


Figure1: Output Characteristics

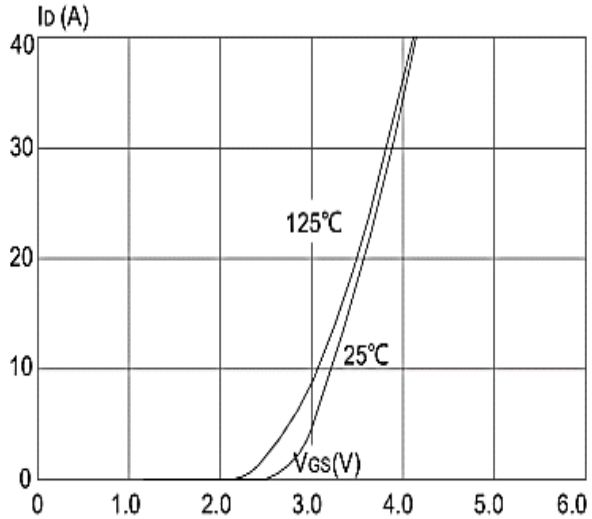


Figure 2: Typical Transfer Characteristics

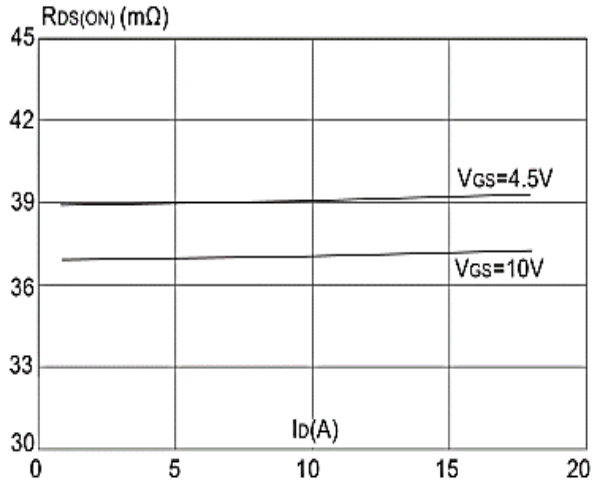


Figure 3:On-resistance vs. Drain Current

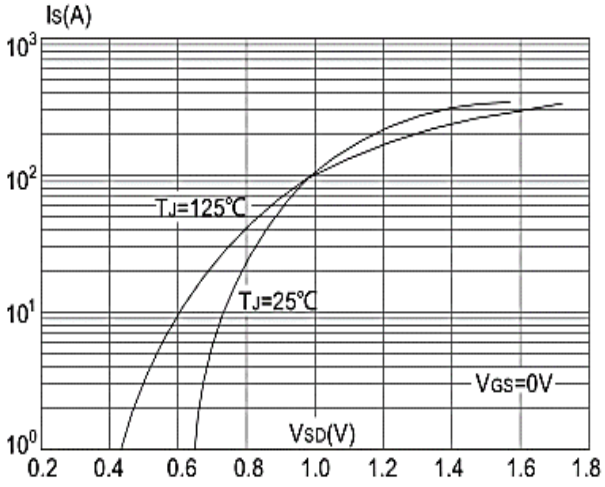


Figure 4: Body Diode Characteristics

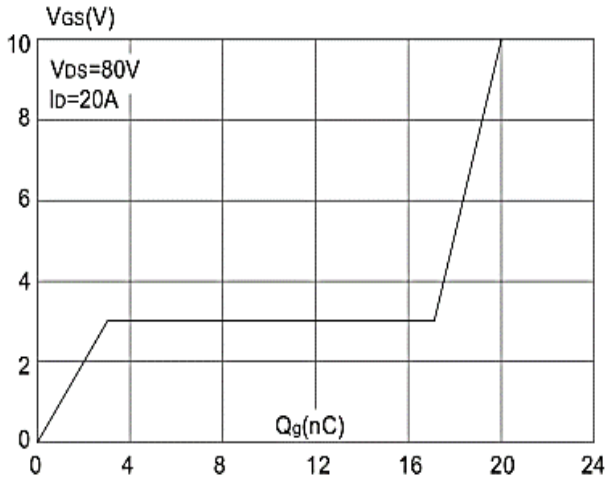


Figure 5: Gate Charge Characteristics

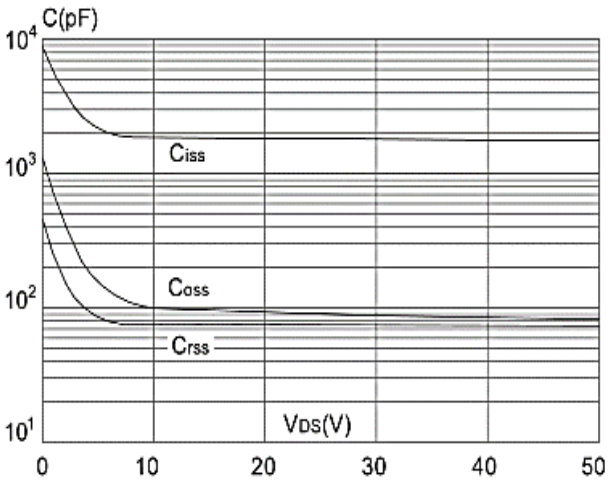


Figure 6: Capacitance Characteristics

Typical Characteristics

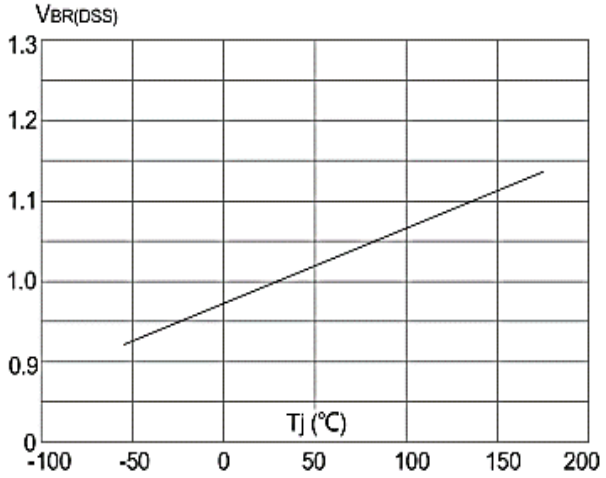


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

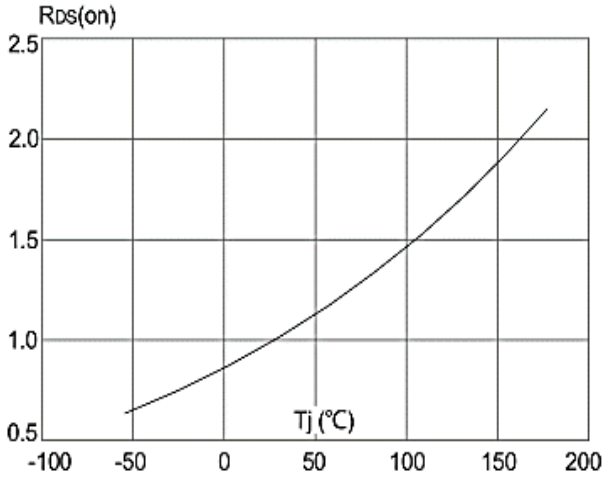


Figure 8: Normalized on Resistance vs Junction Temperature

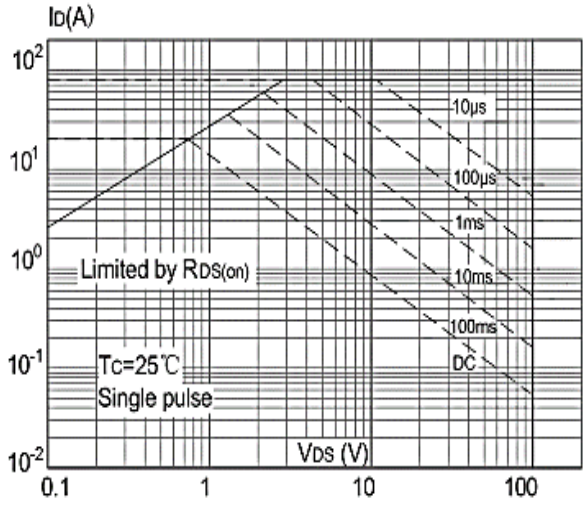


Figure 9: Maximum Safe Operating Area vs. Case Temperature

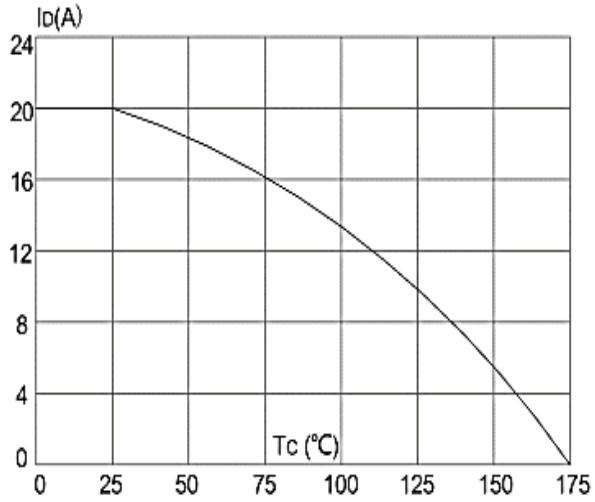


Figure 10: Maximum Continuous Drain Current

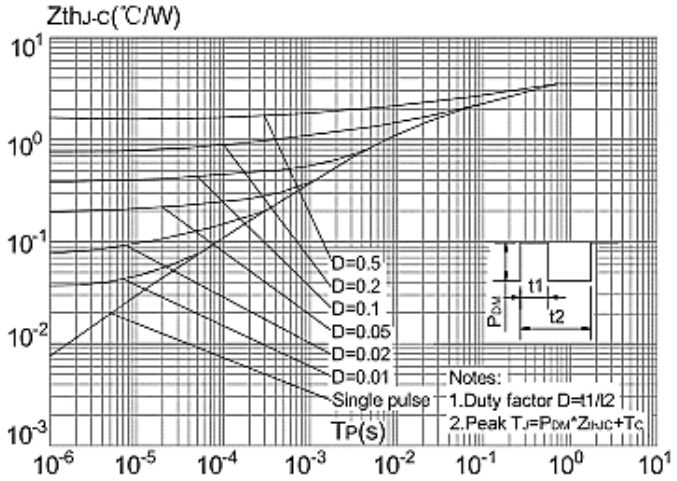
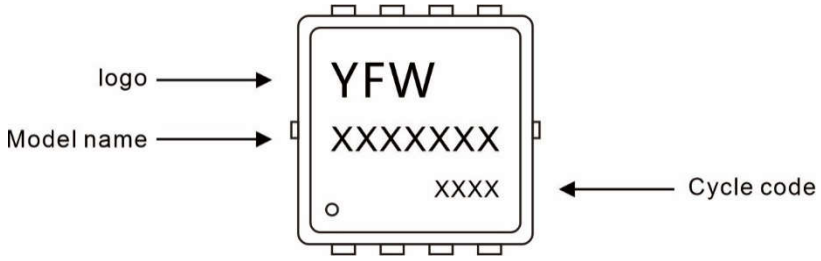


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

Marking Diagram

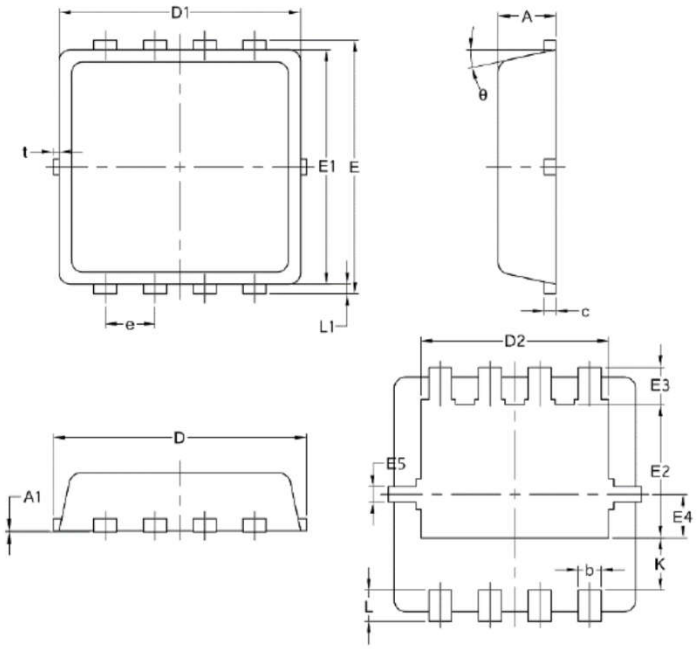


Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW20N10DF	PDFN3*3-8L	0.0023oz(0.065g)	5000pcs/reel	10000pcs/box 50000pcs/Carton

Package Dimensions

PDFN3*3-8L



Dim	Millimeter		mil	
	Min.	Max.	Min.	Max.
A	0.70	0.85	0.0276	0.0335
A1	-	0.05	-	0.002
b	0.20	0.40	0.008	0.016
c	0.10	0.25	0.004	0.010
D	3.15	3.45	0.124	0.136
D1	3.00	3.25	0.118	0.128
D2	2.29	2.65	0.09	0.104
E	3.15	3.45	0.124	0.136
E1	2.90	3.20	0.114	0.126
E2	1.54	1.94	0.061	0.076
E3	0.28	0.65	0.011	0.026
E4	0.37	0.77	0.015	0.030
E5	0.10	0.30	0.004	0.012
e	0.60	0.70	0.024	0.028
K	0.59	0.89	0.023	0.035
L	0.30	0.50	0.012	0.020
L1	0.06	0.20	0.002	0.008
t	-	0.13	-	0.005
Φ	10℃	14℃	10℃	14℃

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