

60V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

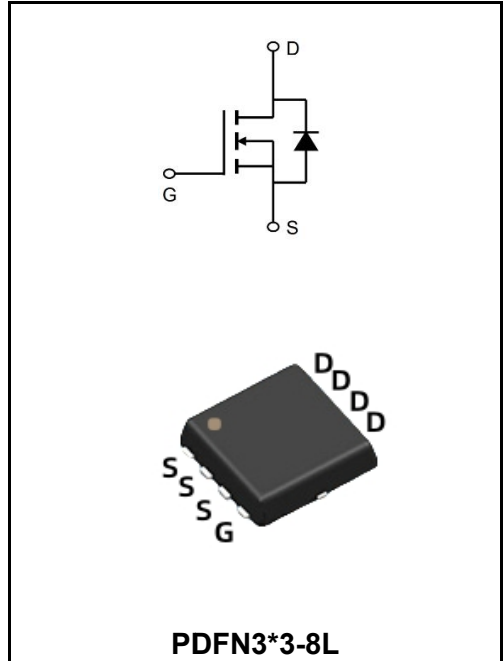
I_D	20A
V_{DS}	60V
R_{DS(on)-typ(@V_{GS}=10V)}	<35mΩ(Typ:24mΩ)
R_{DS(on)-typ(@V_{GS}=4.5V)}	<45mΩ(Typ:33mΩ)

DESCRIPTION

The YFW20N06DF 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.

APPLICATION

- ◆VBUS
- ◆Wireless impact
- ◆Mobile phone fast charging



Absolute Maximum Ratings (T_C=25°C unless otherwise noted)

Characteristics		Symbols	Value	Units
Drain-Source Voltage		V_{DS}	60	V
Gate - Source Voltage		V_{GS}	±20	V
Continuous Drain Current	@T _C =25°C	I_D	20	A
Continuous Drain Current	@T _C =100°C	I_D	12	A
Pulsed Drain Current ^{note1}		I_{DM}	80	A
Single Pulse Avalanche Energy ^{note2}		E_{AS}	18	mJ
Power dissipation	T _C =25 °C	P_D	35	W
Thermal Resistance Junction-Case		R_{θJC}	3.5	°C/W
Storage Temperature Range		T_{STG}	-55 to +150	°C
Operating Junction Temperature Range		T_J	-55 to +150	°C

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	BV_{DSS}	60	-	-	V
Drain-Source Leakage Current	V _{DS} =60V, V _{GS} =0V	I_{DSS}	-	-	1.0	μA
Gate-Source Leakage Current	V _{DS} =0V, V _{GS} =±20V	I_{GSS}	-	-	±100	nA
Gate -Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	V_{GS(th)}	1.0	1.6	2.5	V
Drain-source on-state resistance ³	V _{GS} =10V, I _D =10A	R_{DS(ON)}	-	24	35	mΩ
	V _{GS} =4.5V, I _D =5A		-	33	45	
Input Capacitance	V _{DS} =25V V _{GS} =0V f=1MHz	C_{iss}	-	1148	-	μF
Output Capacitance		C_{oss}	-	58.5	-	
Reverse Transfer Capacitance		C_{rss}	-	49.4	-	
Total Gate Charge	V _{DS} =30V I _D =10A V _{GS} =10V	Q_g	-	20.3	-	nC
Gate-Source Charge		Q_{gs}	-	3.7	-	
Gate Drain("Miller") Charge		Q_{gd}	-	5.3	-	
Turn-On Delay Time	V _{DS} =30V, I _D =20A, R _{GEN} =1.8Ω, V _{GS} =10V	t_{d(on)}	-	7.6	-	ns
Rise Time		T_r	-	20	-	
Turn-Off Delay Time		t_{d(OFF)}	-	15	-	
Fall Time		t_f	-	24	-	
Maximum Continuous Drain to Source Diode Forward Current		I_S	-	-	20	A
Maximum Pulsed Drain to Source Diode Forward Current		I_{SM}	-	-	80	A
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/us	trr	-	29	-	ns
Body Diode Reverse Recovery Charge		Qrr	-	43	-	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition : T_J=25°C, V_{DD}=30V, V_G=10V, L=0.5mH, R_G=25Ω, I_{AS}=8.5A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Characteristics

Figure 1: Output Characteristics

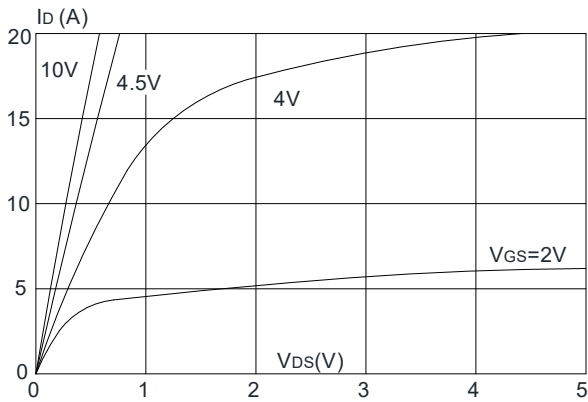


Figure 2: Typical Transfer Characteristics

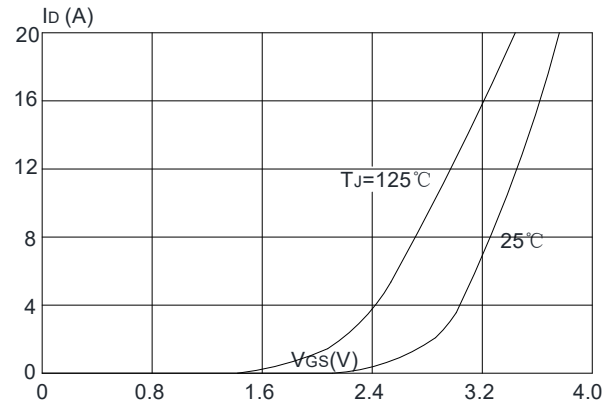


Figure 3: On-resistance vs. Drain Current

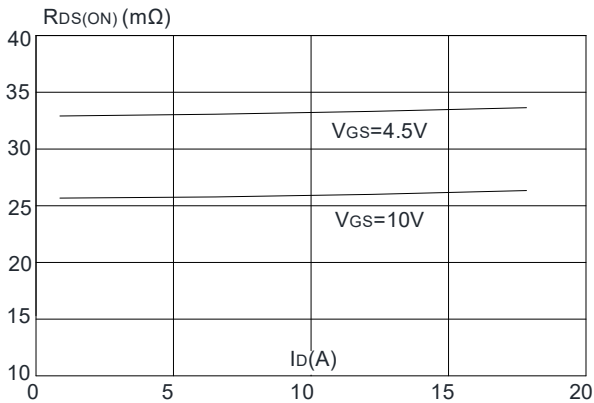


Figure 4: Body Diode Characteristics

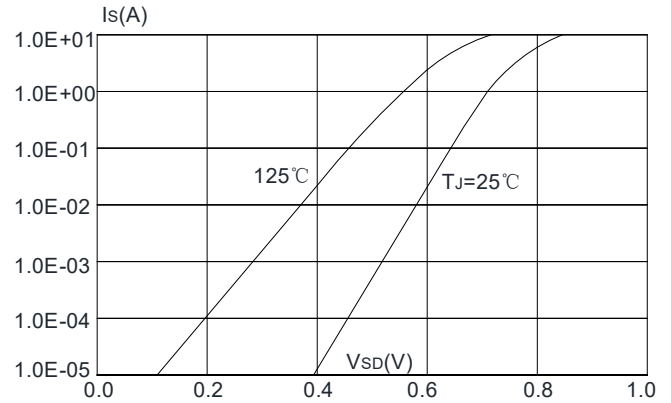


Figure 5: Gate Charge Characteristics

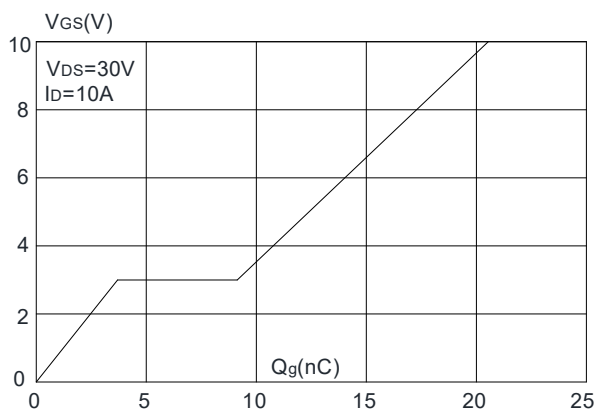
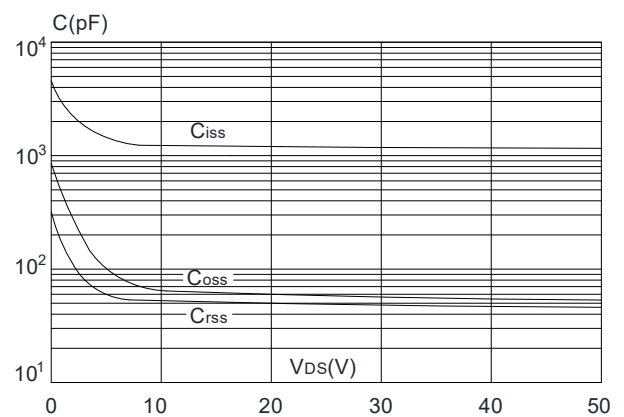


Figure 6: Capacitance Characteristics



Typical Characteristics

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

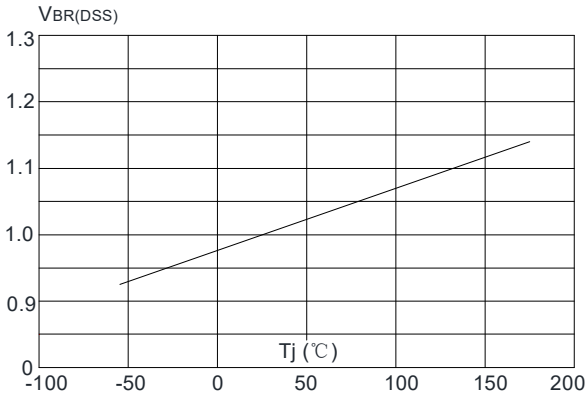


Figure 8: Normalized on Resistance vs. Junction Temperature

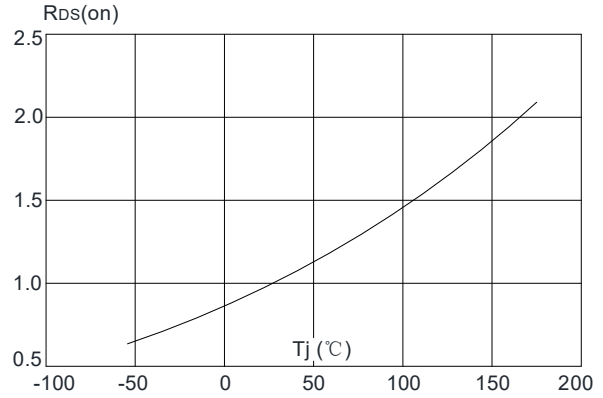


Figure 9: Maximum Safe Operating Area

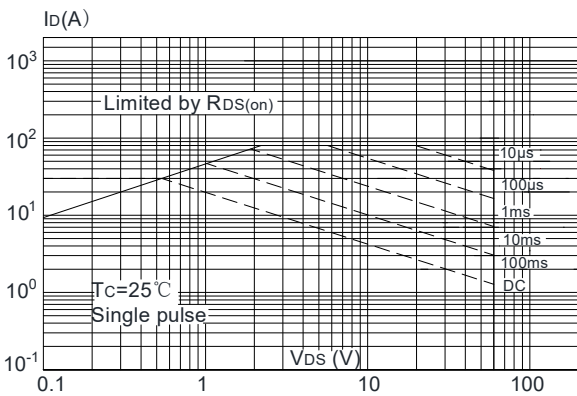


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

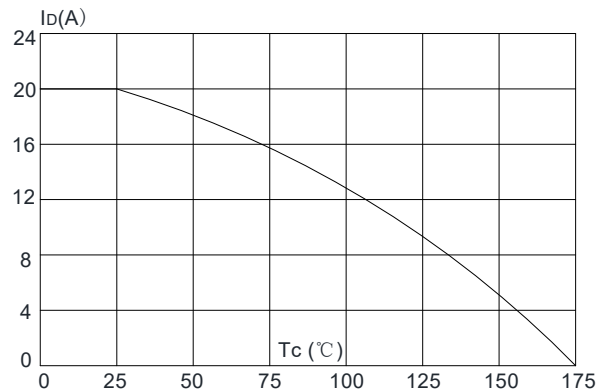
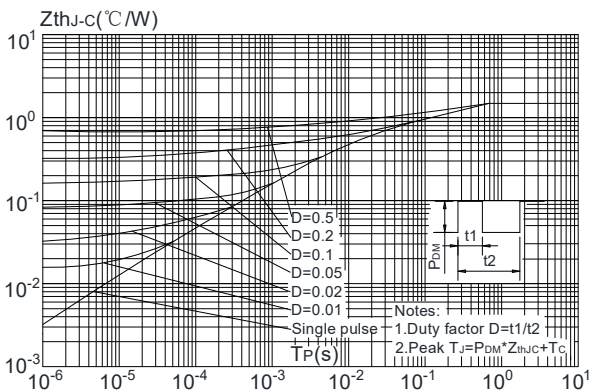
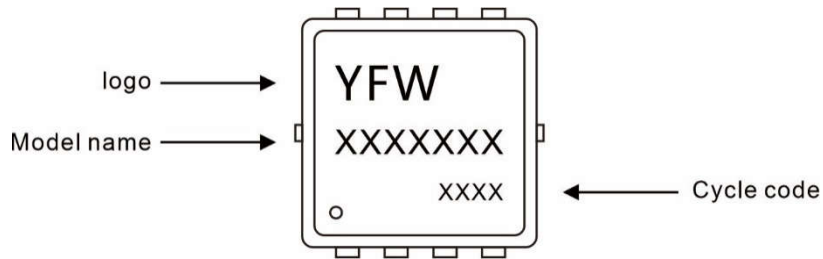


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW20N06DF	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°C	14°C	10°C	14°C

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