

30V N-Channel Enhancement Mode MOSFET

MAIN CHARACTERISTICS

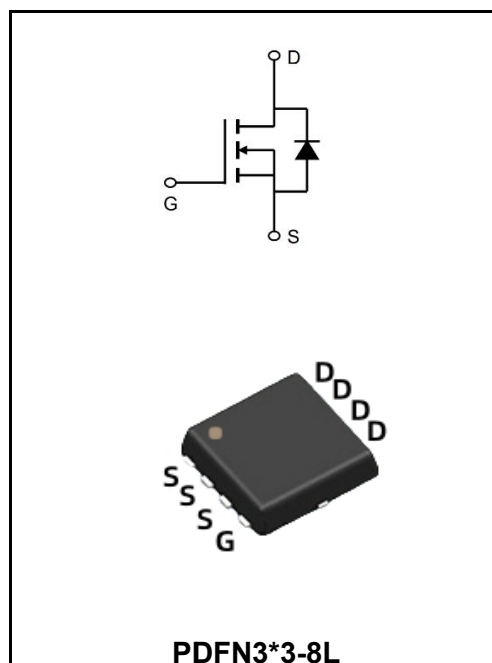
I_D	80A
V_{DSS}	30V
$R_{DS(on)-typ}(@V_{GS}=10V)$	<4.5mΩ(Typ:3.5mΩ)
$R_{DS(on)-typ}(@V_{GS}=4.5V)$	<9.0mΩ(Typ:5.8mΩ)

Description

The YFW80N03DF 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

- ♦Automotive lighting
- ♦Load switch
- ♦Uninterruptible power supply



Absolute Maximum Ratings ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Parameter		Symbol	Value	Units
Drain-to-Source Voltage		V_{DS}	30	V
Gate-to-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	$T_C = 25^{\circ}\text{C}$	I_D	80	A
	$T_C = 100^{\circ}\text{C}$		51	
Pulsed Drain Current ⁽¹⁾		I_{DM}	240	A
Single Pulsed Avalanche Energy ⁽²⁾		E_{AS}	121	mJ
Power Dissipation	$T_C = 25^{\circ}\text{C}$	P_D	39	W
Thermal Resistance, Junction to Ambient ⁽³⁾		$R_{\theta JA}$	41	$^{\circ}\text{C/W}$
Thermal Resistance, Junction to Case		$R_{\theta JC}$	3.2	
Storage Temperature Range		T_{STG}	-55 to 150	$^{\circ}\text{C}$
Operating Junction Temperature Range		T_J	-55 to 150	$^{\circ}\text{C}$

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

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	I _D = 250μA, V _{GS} = 0V	BV_{DSS}	30	-	-	V
Zero Gate Voltage Drain Current	V _{DS} = 30V, V _{GS} = 0V	I_{DSS}	-	-	1.0	A
Gate-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	1.9	2.5	V
Static Drain-Source ON-Resistance ⁽⁴⁾	V _{GS} = 10V, I _D = 30A	R_{DS(ON)}	-	3.5	4.5	mΩ
	V _{GS} = 4.5V, I _D = 20A		-	5.8	9.0	mΩ
Input Capacitance	V _{GS} = 0V V _{DS} = 15V f = 1MHz	C_{iss}	-	3089	-	pF
Output Capacitance		C_{oss}	-	372	-	pF
Reverse Transfer Capacitance		C_{rss}	-	302	-	pF
Total Gate Charge	V _{GS} = 0 to 10V V _{DS} = 15V I _D = 30A	Q_g	-	58	-	nC
Gate Source Charge		Q_{gs}	-	12	-	nC
Gate Drain("Miller") Charge		Q_{gd}	-	13	-	nC
Turn-On DelayTime	V _{GS} = 10V, V _{DD} = 15V I _D = 30A R _{GEN} = 3Ω	t_{d(on)}	-	11	-	ns
Turn-On Rise Time		t_r	-	29	-	ns
Turn-Off DelayTime		t_{d(off)}	-	47	-	ns
Turn-Off Fall Time		t_f	-	18	-	ns
Maximum Continuous Drain to Source Diode Forward Current		I_S	-	-	80	A
Maximum Pulsed Drain to Source Diode Forward Current		I_{SM}	-	-	240	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 = 30A, di/dt = 100A/us	trr	-	16	-	ns
Body Diode Reverse Recovery Charge		Qrr	-	7	-	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. E_{AS} condition: Starting T_J=25 °C, V_{DD}=15V, V_G=10V, R_G=25ohm, L=0.5mH, I_{AS}=22A
3. R_{JA} is measured with the device mounted on a 1inch² pad of 2oz copper FR4 PCB
4. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 0.5%.

Typical Performance Characteristics

Figure 1: Output Characteristics

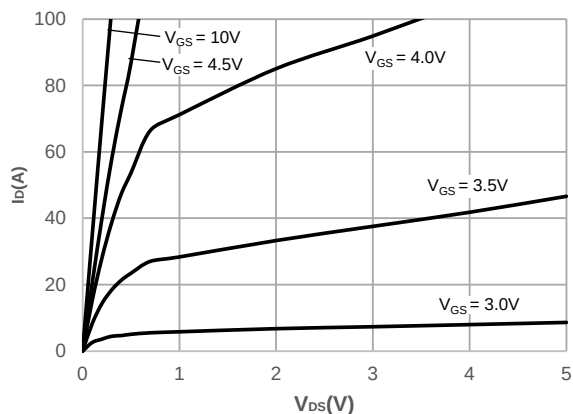


Figure 2: Typical Transfer Characteristics

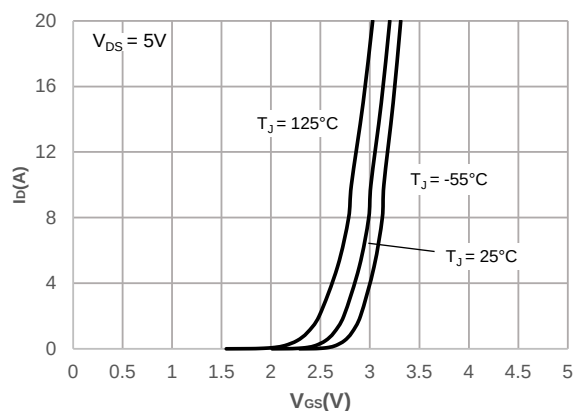


Figure 3: On-resistance vs. Drain Current

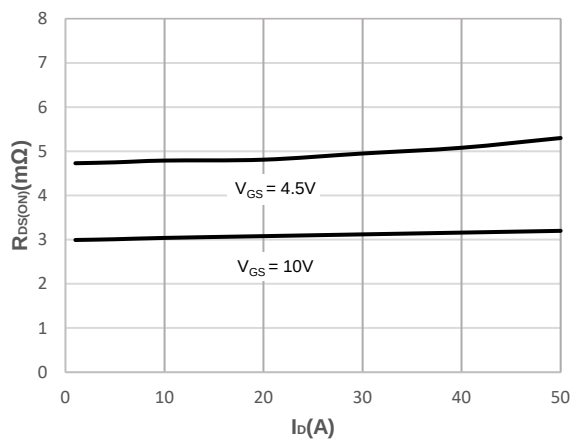


Figure 4: Body Diode Characteristics

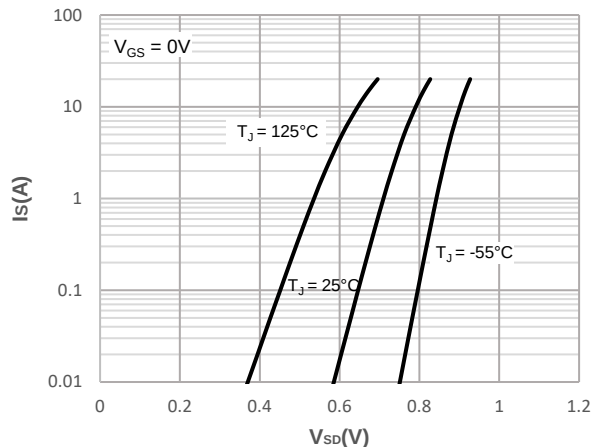


Figure 5: Gate Charge Characteristics

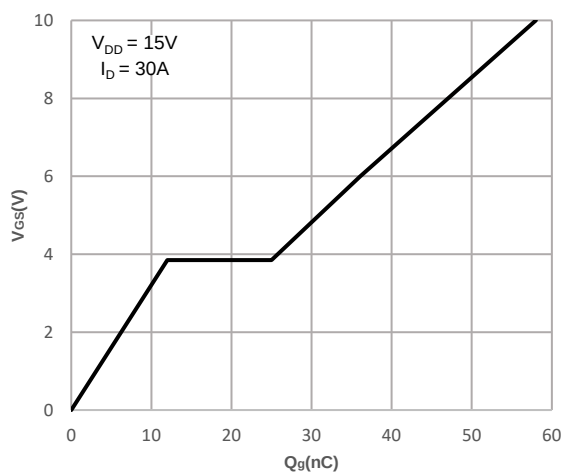
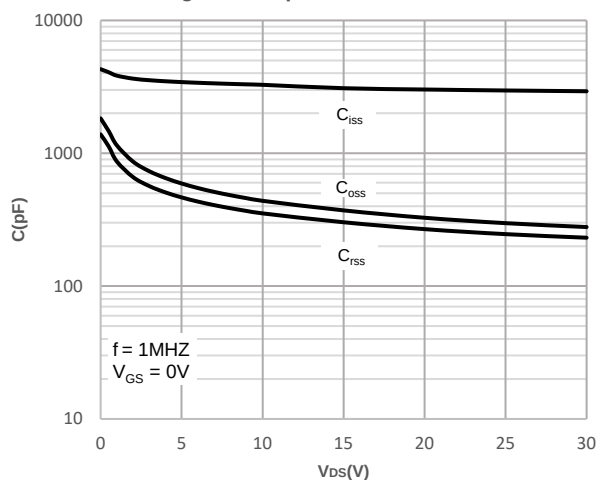


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

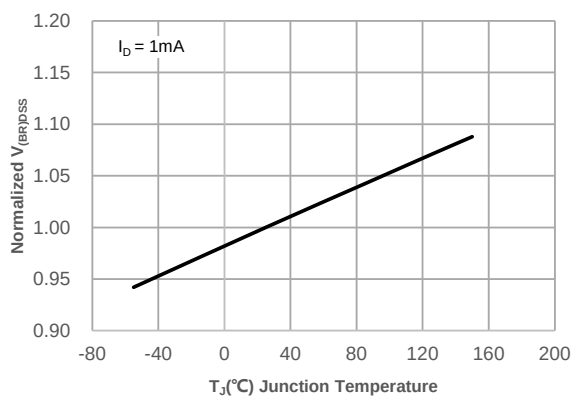


Figure 8: Normalized on Resistance vs. Junction Temperature

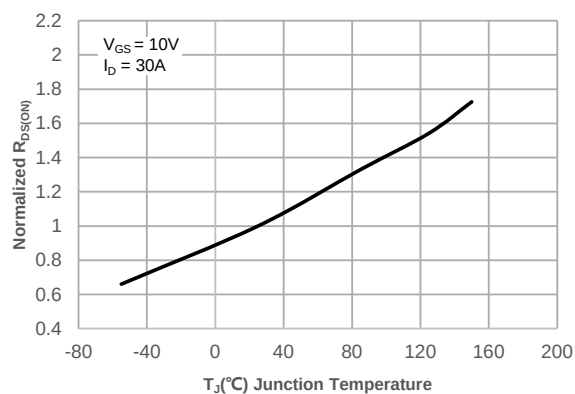


Figure 9: Maximum Safe Operating Area

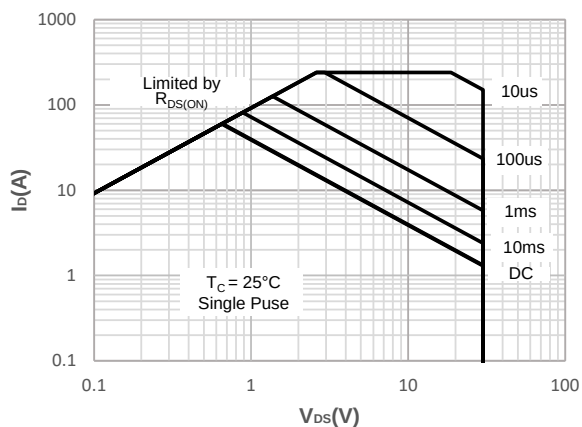


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

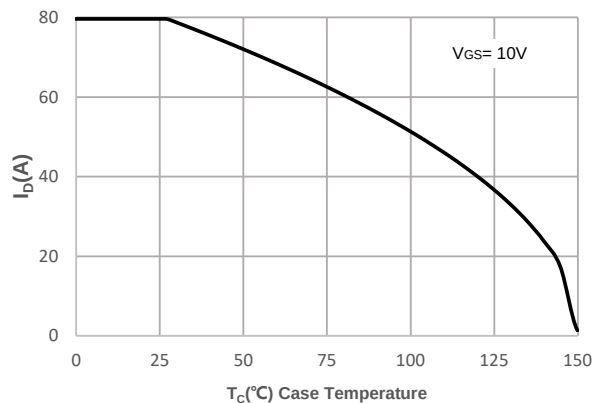


Figure 11: Normalized Maximum Transient Thermal Impedance

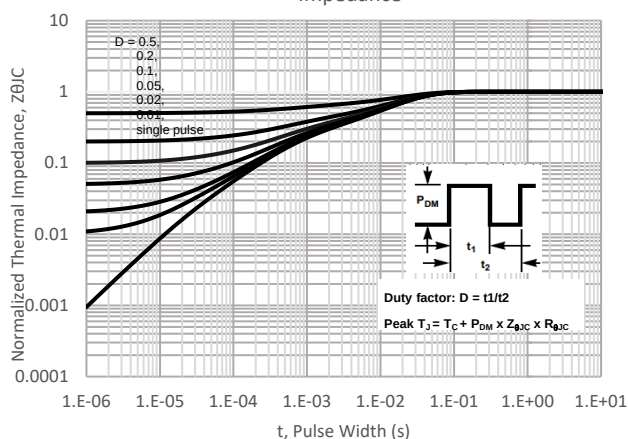
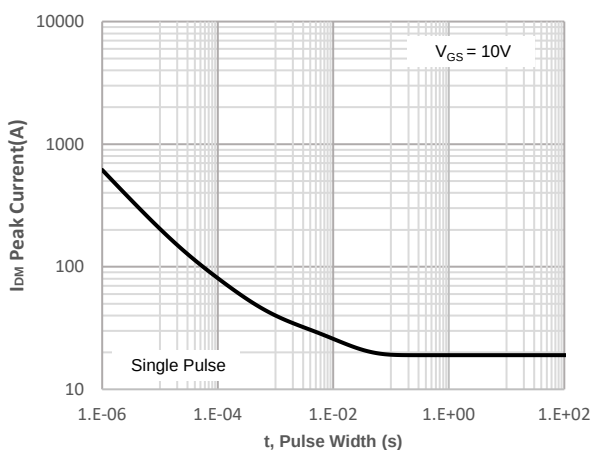
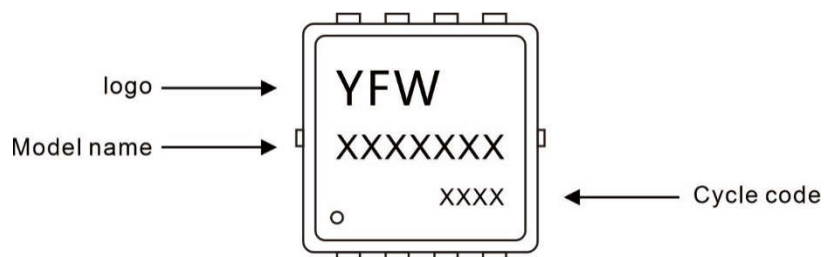


Figure 12: Peak Current Capacity



Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW80N03DF	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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