

-60V P-Channel Trench Power MOSFET

MAIN CHARACTERISTICS

I_D	-30A
V_{DS}	-60V
R_{DS(on)-typ(@V_{GS}=-10V)}	< 30mΩ (Typ: 23.5mΩ)

FEATURES

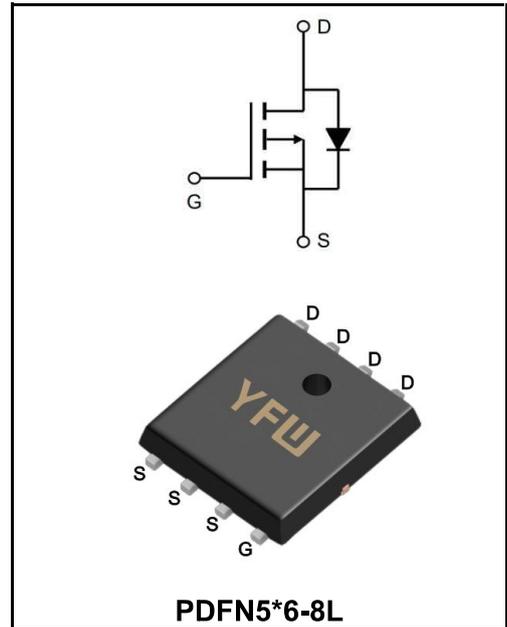
- ◆ Low gate charge
- ◆ Low Crss
- ◆ Fast switching
- ◆ 100% avalanche tested
- ◆ Improved dv/dt capability

APPLICATIONS

- ◆ Brushless motor
- ◆ Load switch
- ◆ Uninterruptible power supply

MECHANICAL DATA

- ◆ Case: PDFN5x6-8L/NF
- ◆ Mounting Position: Any
- ◆ Molded Plastic: UL Flammability Classification Rating 94V-0
- ◆ Lead free in compliance with EU RoHS 2011/65/EU directive
- ◆ Solder bath temperature 275°C maximum, 10s per JESD 22-B106



Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	-60	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	-30	A
Pulsed Drain Current (Note1)	I_{DM}	-120	A
Single Pulse Avalanche Energy	E_{AS}	100	mJ
Power Dissipation	P_D	85	W
Operating Junction Temperature Range	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Thermal Resistance Junction to Case	R_{θJC}	1.43	°C/W
Thermal Resistance, Junction to Ambient	R_{θJA}	62.5	°C/W

Note1: Pulse test: 300 μs pulse width, 2 % duty cycle

Electrical Characteristics at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = -250\ \mu\text{A}$	BV_{DSS}	-60	-	-	V
Drain-Source Leakage Current	$V_{DS} = -60\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	-	-	-1	μA
Gate Leakage Current	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$	$V_{GS(th)}$	-1	-	-2.2	V
Drain-Source On-State Resistance	$V_{GS} = -10\text{ V}, I_D = -20\text{ A}$	$R_{DS(ON)}$	-	23.5	30	mΩ
	$V_{GS} = -4.5\text{ V}, I_D = -15\text{ A}$		-	27	36	
Input Capacitance	$V_{DS} = -25\text{ V}, V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}$	C_{iss}	-	2726	-	pF
Output Capacitance		C_{oss}	-	176	-	
Reverse Transfer Capacitance		C_{rss}	-	144	-	
Turn-on Delay Time(Note2)	$V_{DS} = -40\text{ V}, V_{GS} = -10\text{ V}, R_G = 5\ \Omega, I_D = -20\text{ A}$	$t_{d(on)}$	-	11	-	ns
Rise Time(Note2)		T_r	-	59	-	
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	116	-	
Fall Time(Note2)		t_f	-	66	-	
Total Gate Charge(Note2)	$V_{DS} = -40\text{ V}, V_{GS} = -10\text{ V}, I_D = -20\text{ A}$	Q_g	-	68	-	nC
Gate to Source Charge(Note2)		Q_{gs}	-	5.6	-	
Gate to Drain Charge(Note2)		Q_{gd}	-	22	-	
Maximun Body-Diode Continuous Current		I_S	-	-	-30	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	-120	A
Drain-Source Diode Forward Voltage	$V_{GS} = 0\text{ V}, I_S = -20\text{ A}, T_J = 25$	V_{SD}	-	-	-1.2	V
Reverse Recovery Time(Note2)	$I_{SD} = -20\text{ A}, V_{GS} = 0\text{ V}, dI_F / dt = 100\text{ A}/\mu\text{s}$	t_{rr}	-	27	-	ns
Reverse Recovery Charge(Note2)		Q_{rr}	-	60	-	nC

Note2: Pulse test: 300 μs pulse width, 2 % duty cycle

Ratings and Characteristic Curves

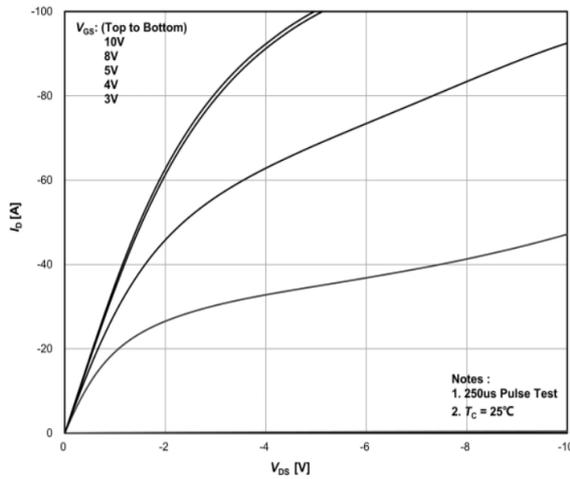


Figure 1. On-Region Characteristics

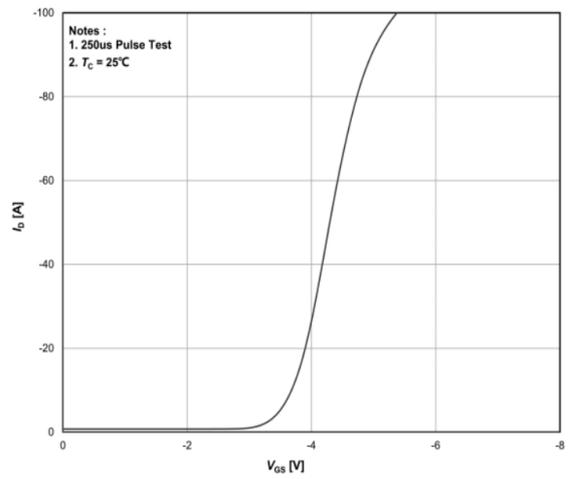


Figure 2. Transfer Characteristics

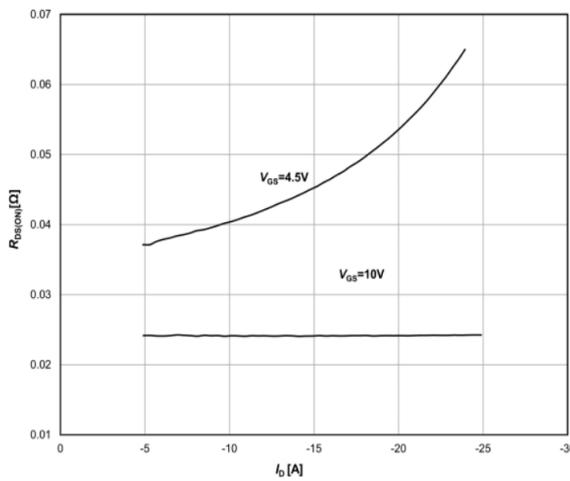


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

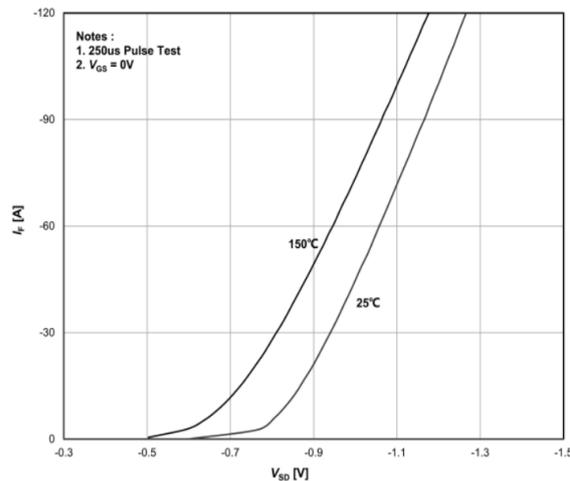


Figure 4. Body Diode Forward Voltage Variation with Current

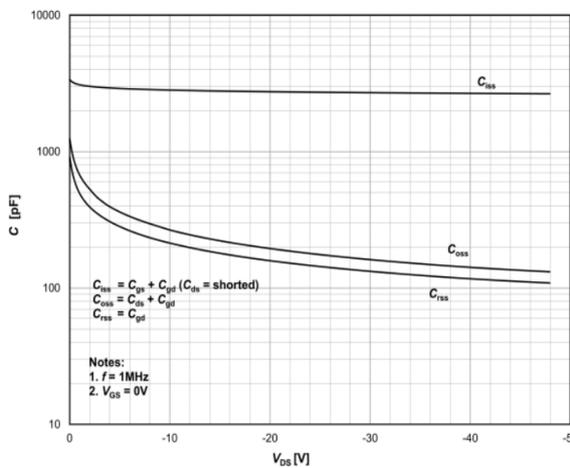


Figure 5. Capacitance Characteristics

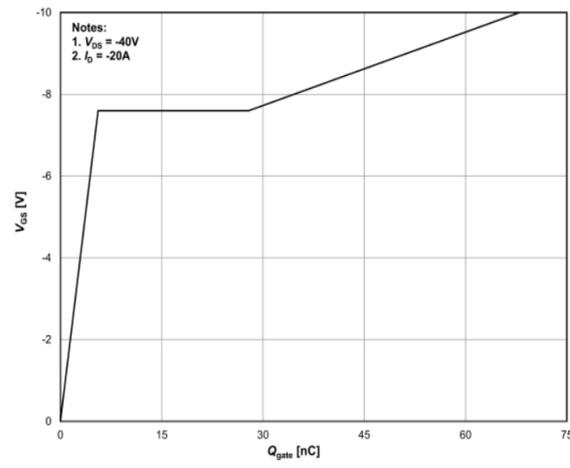


Figure 6. Gate Charge Characteristics

Ratings and Characteristic Curves

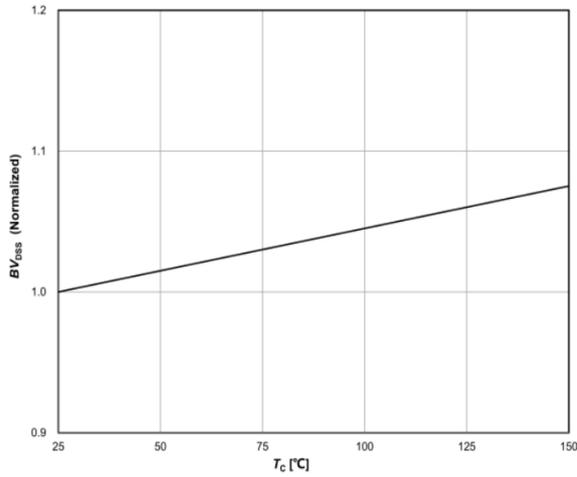


Figure 7. Breakdown Voltage Variation vs Temperature

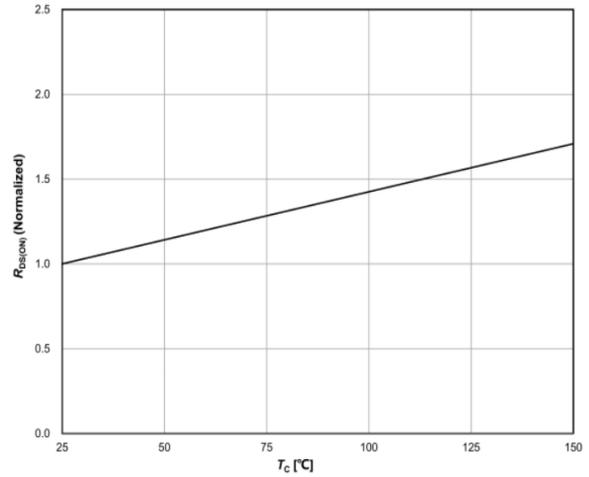


Figure 8. On-Resistance Variation vs Temperature

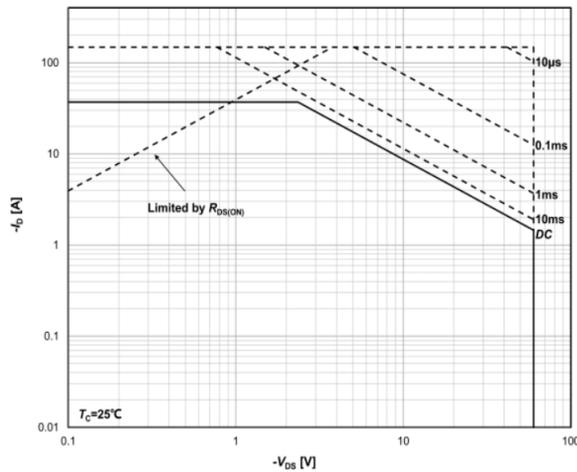


Figure 9. Maximum Safe Operating Area³⁾

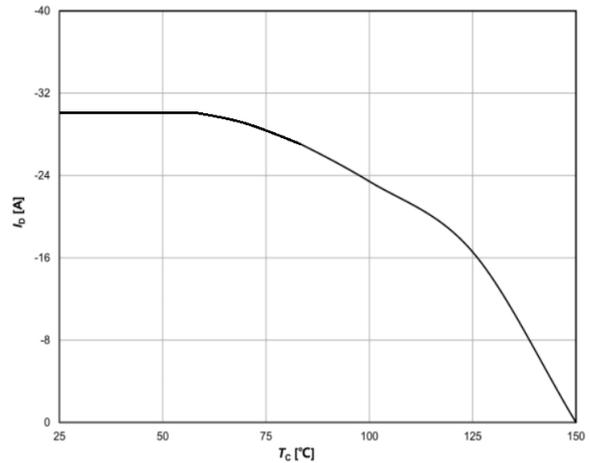


Figure 10. Maximum Drain Current vs Case Temperature

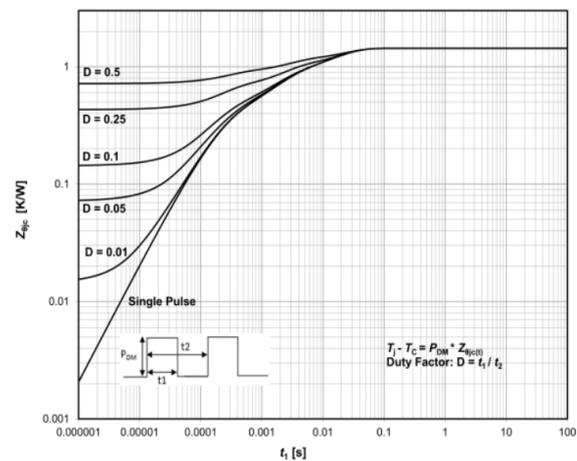
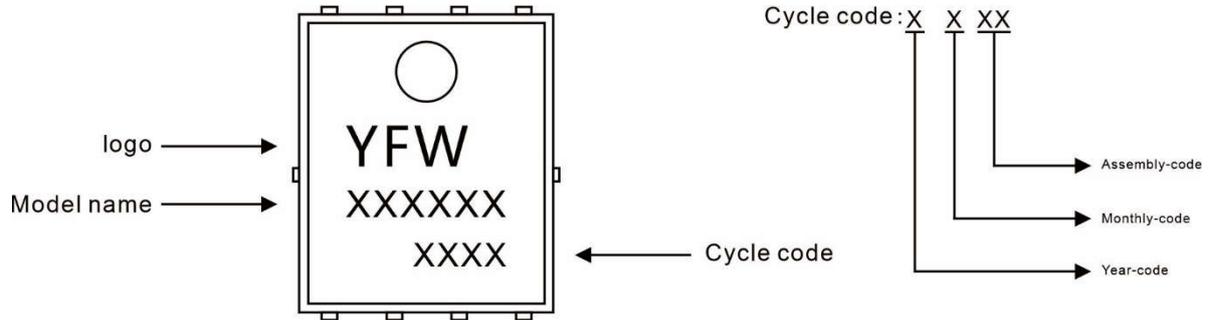


Figure 11. Transient Thermal Response Curve

Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW30P06NF	PDFN5*6-8L	0.0032oz(0.093g)	5000pcs/reel	10000pcs/box 50000pcs/Carton

Package Dimensions

PDFN5*6-8L

Dim	Millimeter		mil	
	Min.	Max.	Min.	Max.
A	0.9	1.2	35	45
A2	0.204	0.304	8	12
b	0.4ref.		16ref.	
b1	0.2	0.4	8	16
D	5.0	5.3	197	209
D1	4.84	5.24	191	206
E	5.95	6.35	234	250
E1	3.275	3.675	129	145
E2	5.69	6.09	224	232
e	1.27typ.		50typ.	
K	1.29typ.		51typ.	
L	0.585	0.785	23	27
L1	0.7typ.		28typ.	

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