

-100V P-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	-50A
V_{DSS}	-100V
R_{DS(on)-typ}(@V_{GS}=-10V)	<55mΩ (Typ:42mΩ)

FEATURES

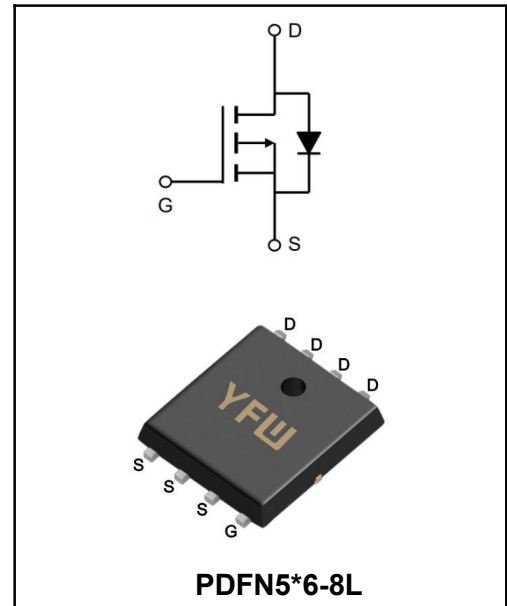
The YFW50P10NF uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

APPLICATIONS

- ♣ 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	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	-100	V
Gate-Source Voltage	V _{GS}	±20	V
Continue Drain Current	I _D	-50	A
Pulsed Drain Current (Note1)	I _{DM}	-140	A
Power Dissipation	P _D	113	W
Single Pulse Avalanche Energy	E _{AS}	87	mJ
Avalanche Current	I _{AS}	-24.5	A
Operating Temperature Range	T _J	-55 to +150	°C
Storage Temperature Range	T _{STG}	-55 to +150	°C
Thermal Resistance, Junction to Case (Note1)	R _{θJC}	1.1	°C/W
Thermal Resistance, Junction to Ambient (Note1)	R _{θJA}	62.5	°C/W

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

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	BV_{DSS}	-100	-110	-	V
Drain-Source Leakage Current	$V_{DS} = -100\text{V}, V_{GS} = 0\text{ V}$	I_{DSS}	-	-	-1.0	μA
Gate Leakage Current	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	$V_{GS(th)}$	-1.0	-1.8	-2.5	V
Drain-Source On-State Resistance	$V_{GS} = -10\text{ V}, I_D = -15\text{A}$	$R_{DS(on)}$	-	42	55	m Ω
	$V_{GS} = -4.5\text{ V}, I_D = -10\text{A}$		-	45	65	
Input Capacitance	$V_{GS} = 0\text{ V},$ $V_{DS} = -25\text{ V}$ $f=1\text{ MHz}$	C_{iss}	-	9023	-	pF
Output Capacitance		C_{oss}	-	210	-	pF
Reverse Transfer Capacitance		C_{rss}	-	180	-	pF
Turn-on Delay Time		$V_{DD}=-50\text{V}$ $V_{GS}=-10\text{V}$ $R_G=9\Omega$ $I_D=-15\text{A}$	$t_{d(ON)}$	-	20	-
Rise Time	t_r		-	78	-	ns
Turn-Off Delay Time	$t_{d(OFF)}$		-	43	-	ns
Fall Time	t_f		-	64	-	ns
Total Gate Charge	$V_{DS}=-50\text{V}$ $V_{GS}=-10\text{V}$ $I_D=-15\text{A}$	Q_G	-	125	-	nC
Gate to Source Charge		Q_{GS}	-	21	-	nC
Gate to Drain Charge		Q_{GD}	-	25	-	nC
Maximun Body-Diode Continuous Current (Note 2)		I_S	-	-	-50	A
Maximun Body-Diode Pulsed Curre		I_{SM}	-	-	-140	A
Drain-Source Diode Forward Voltage	$V_{GS}=0\text{V}, I_S=-30\text{A}$	V_{SD}	-	-	1.2	V
Reverse Recovery Time	$I_S = I_F, I_{SD}=-15\text{A}, V_{GS} = 0\text{ V},$ $V, dI / dt = 100\text{ A}/\mu\text{s}$	t_{rr}	-	95	-	ns
Reverse Recovery Charge		Q_{rr}	-	145	-	μC

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 $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$
- 3、 The EAS data shows Max. rating . The test condition is $V_{DD} = -50\text{ V}, V_{GS} = -10\text{ V}, L = 0.5\text{ mH}, I_{AS} = -24.5\text{ A}$
- 4、 The power dissipation is limited by 150°C 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.

Ratings and Characteristic Curves

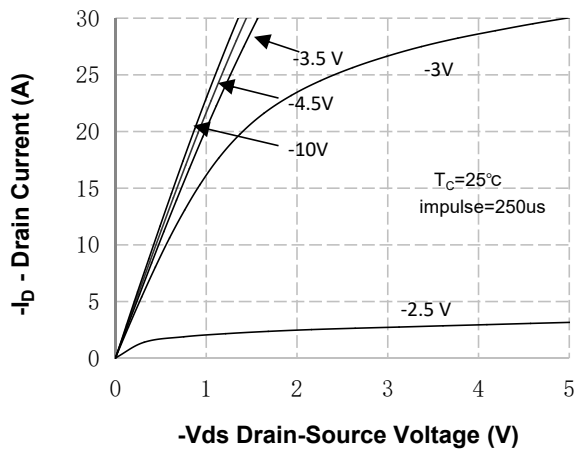


Figure 1. On-Region Characteristics

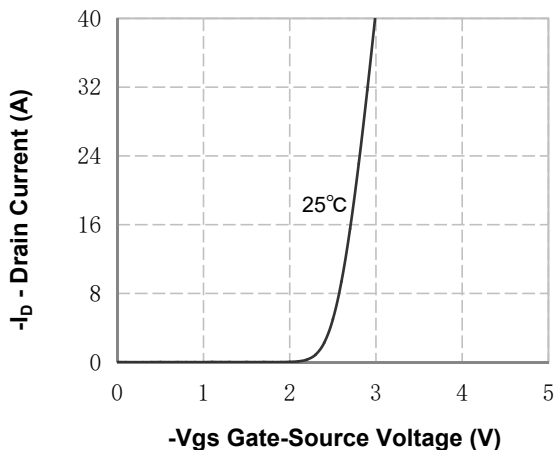


Figure 2. Transfer Characteristics

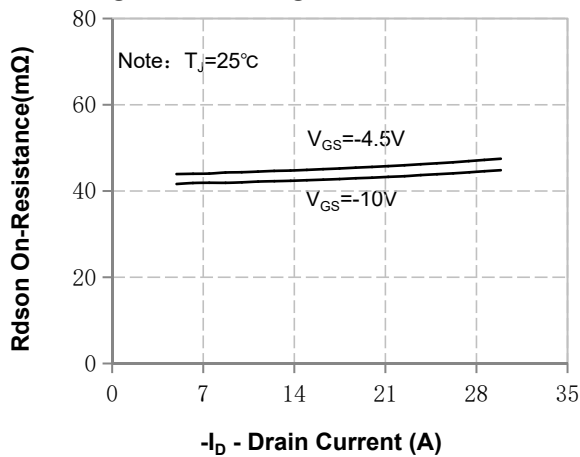


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

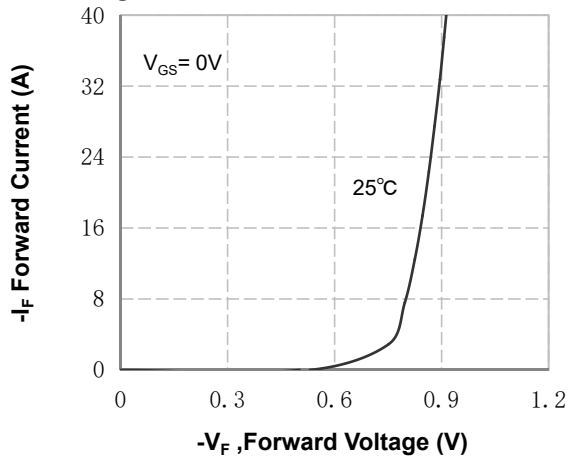


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

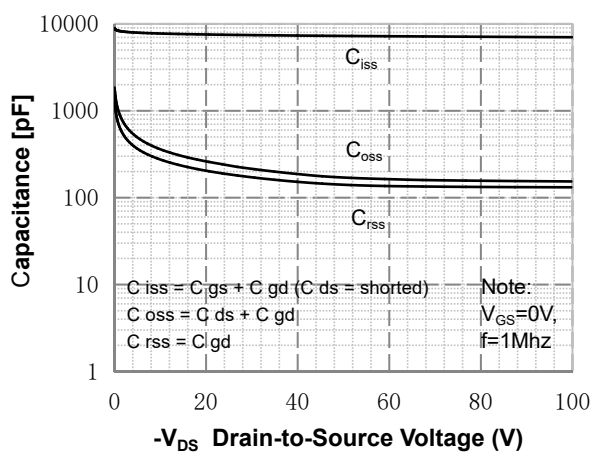


Figure 5. Capacitance Characteristics

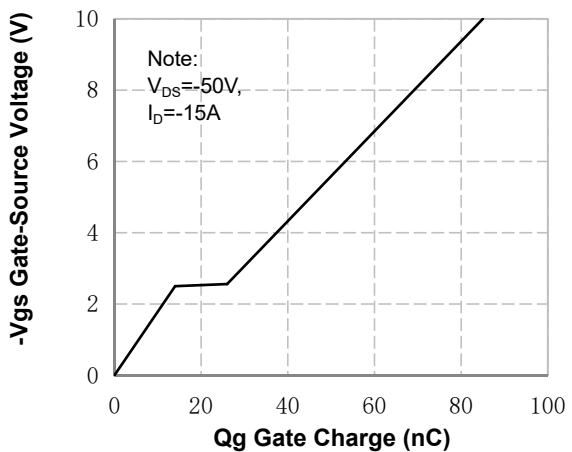


Figure 6. Gate Charge Characteristics

Ratings and Characteristic Curves

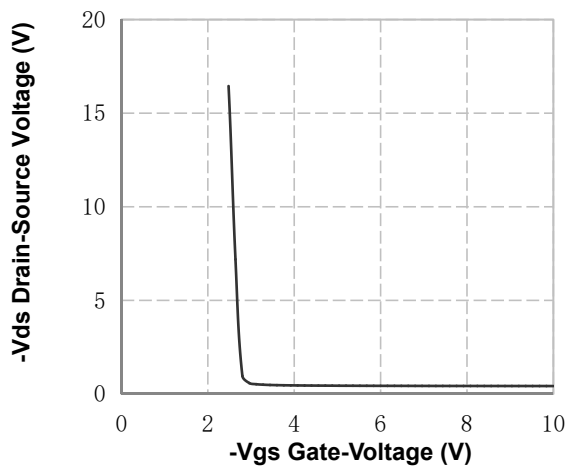


Figure 7. Vds Drain-Source Voltage vs Gate Voltage

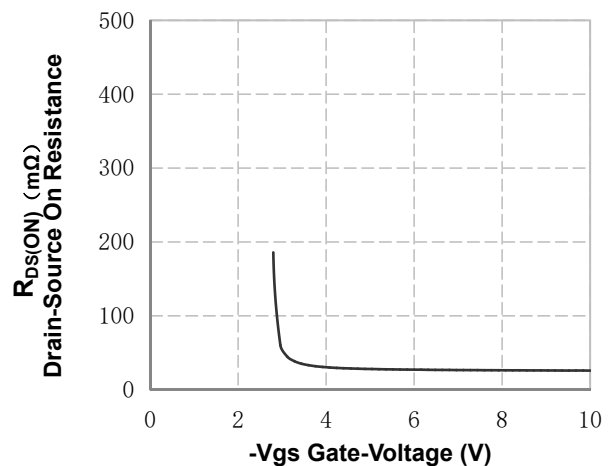


Figure 8. On-Resistance vs Gate Voltage

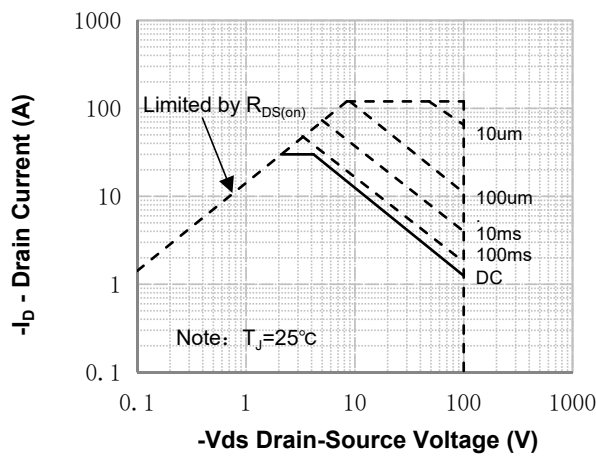


Figure 9. Maximum Safe Operating Area

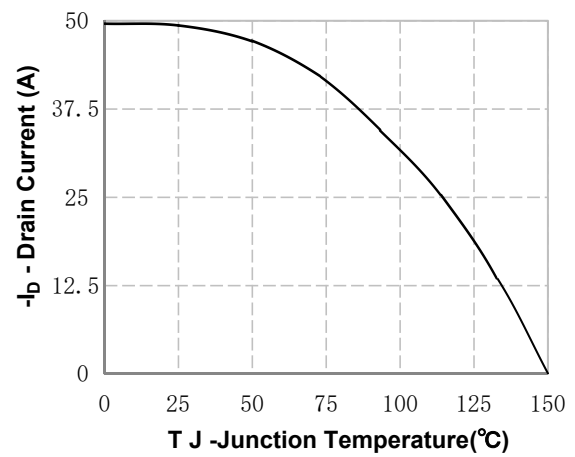


Figure 10. Maximum Continuous Drain Current vs Temperature

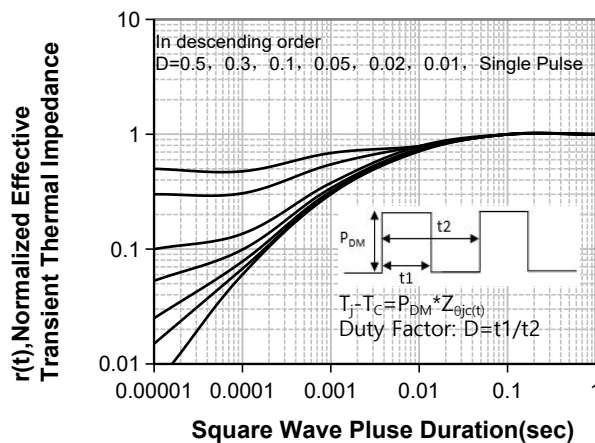
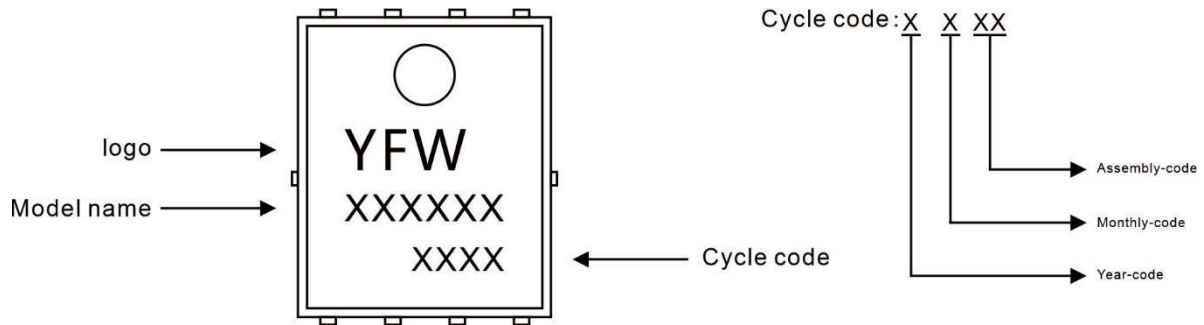


Figure 11. Transient Thermal Response Curve

Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW50P10NF	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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