

150V N-Channel Enhancement Mode Power MOSFET

MAIN CHARACTERISTICS

I_D	90A
V_{DSS}	150V
$R_{DS(on)-typ}(@V_{GS}=10V)$	$<10m\Omega$ (Typ: 8.2mΩ)

FEATURES

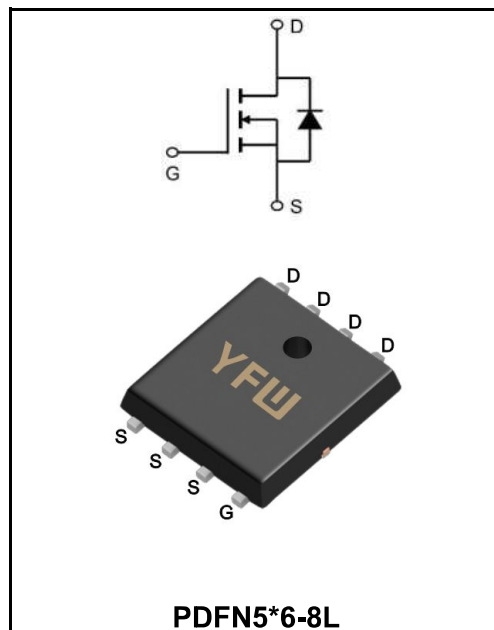
- ♦ Ultra-Low $R_{DS(ON)}$
- ♦ Low Gate Charge
- ♦ High Current Capability
- ♦ **YFW-SGT technology**

APPLICATIONS

- ♦ Power Management in Telecom., Industrial Automatio
- ♦ Motor Driving in Power Tool, E-vehicle, Robotics
- ♦ Current Switching in DC/DC&AC/DC(SR) Sub-system

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 $T_c=25^{\circ}\text{C}$ unless otherwise specified

Characteristics	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	± 20	V
Continue Drain Current	I_D	90	A
Pulsed Drain Current (Note1)	I_{DM}	335	A
Power Dissipation	P_D	179	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	211	mJ
Operating Temperature Range	T_J	150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^{\circ}\text{C}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.55	$^{\circ}\text{C/W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	45	$^{\circ}\text{C/W}$

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

Electrical Characteristics at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\mu\text{A}$	BV_{DSS}	150	-	-	V
Drain-Source Leakage Current	$V_{DS} = 120\text{ V}, V_{GS} = 0\text{ V}$	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	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	$V_{GS(th)}$	2.5	-	4.5	V
Drain-Source On-State Resistance	$V_{GS} = 10\text{ V}, I_D = 20\text{ A}$	$R_{DS(on)}$	-	8.2	10	mΩ
Forward Transconductance	$V_{DS} = 5\text{ V}, I_D = 20\text{ A}$	g_{fs}	-	60	-	S
Input Capacitance	$V_{GS} = 0\text{ V}$ $V_{DS} = 75\text{ V}$ $f = 1\text{ MHz}$	C_{iss}	-	2181	-	pF
Output Capacitance		C_{oss}	-	363	-	pF
Reverse Transfer Capacitance		C_{rss}	-	7.9	-	pF
Turn-on Delay Time(Note2)	$V_{GS}=10\text{V}$ $V_{DD}=75\text{ V}$ $R_G=6\Omega$ $R_L=3.75\Omega$	$t_{d(ON)}$	-	12.5	-	ns
Rise Time(Note2)		t_r	-	24	-	ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	30	-	ns
Fall Time(Note2)		t_f	-	26	-	ns
Total Gate Charge(Note2)	$I_D = 20\text{ A}$ $V_{DD} = 75\text{ V}$ $V_{GS} = 10\text{ V}$	Q_G	-	30	-	nC
Gate to Source Charge(Note2)		Q_{GS}	-	7.5	-	nC
Gate to Drain Charge(Note2)		Q_{GD}	-	6.5	-	nC
Maximun Body-Diode Continuous Current		I_S	-	-	90	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	335	A
Drain-Source Diode Forward Voltage	$I_{SD} = 1\text{ A}$	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}	-	99	-	ns
Reverse Recovery Charge(Note2)		Q_{rr}	-	318	-	nC

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

RATINGS AND CHARACTERISTIC CURVES

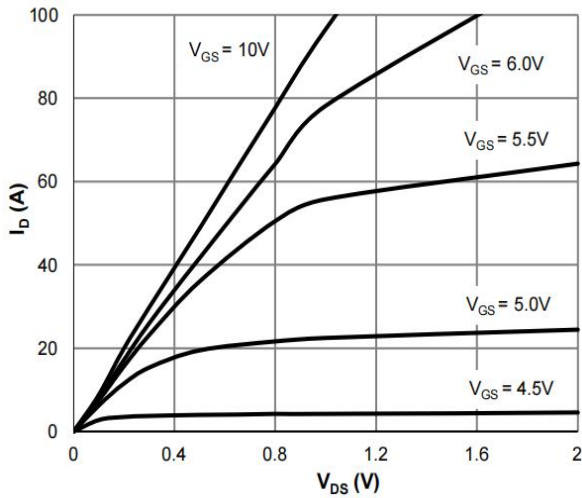


Figure 1: Saturation Characteristics

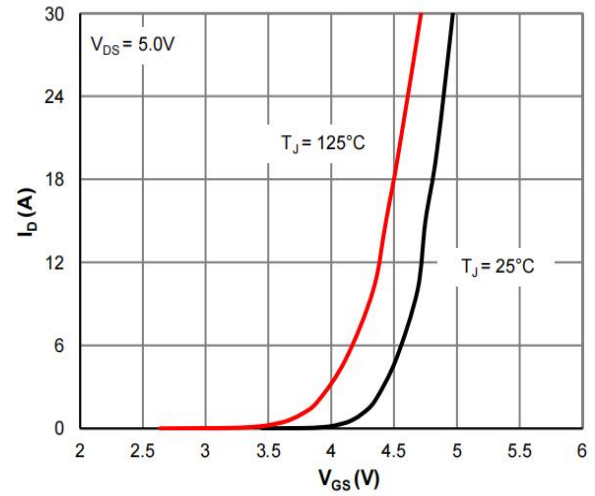


Figure 2: Transfer Characteristics

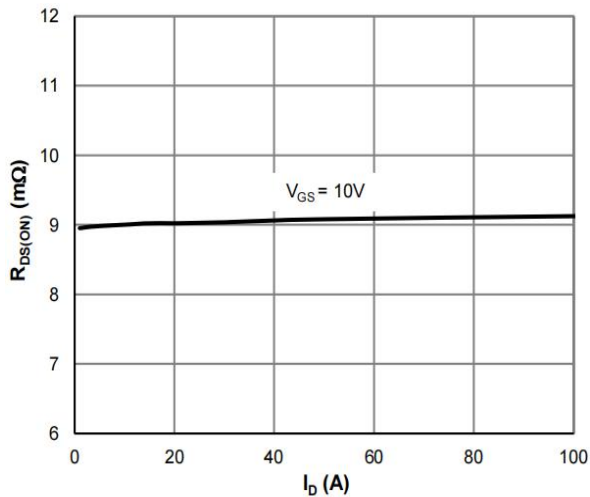


Figure 3: $R_{DS(ON)}$ vs. Drain Current

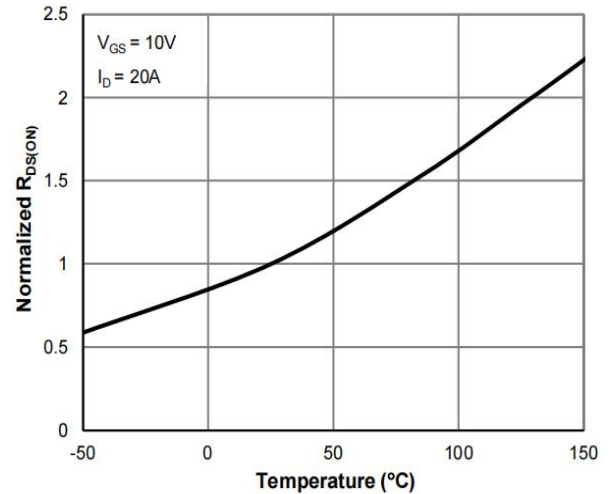


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

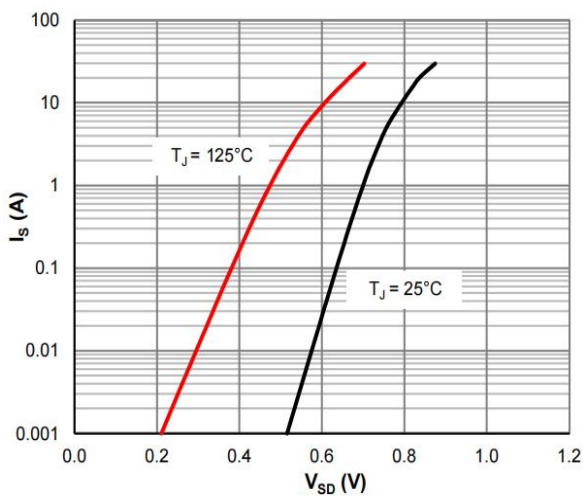


Figure 5: Body-Diode Characteristics

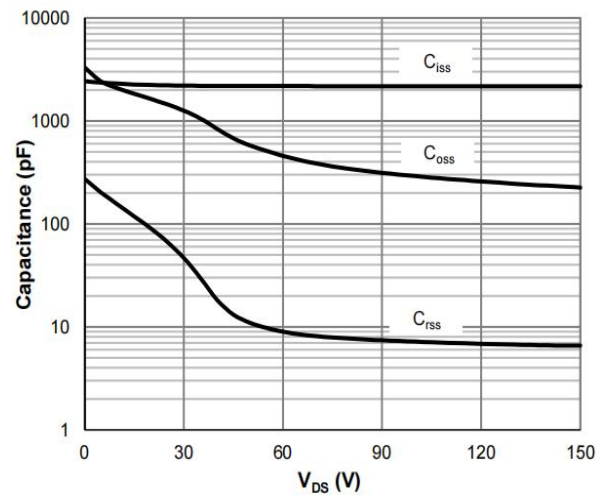


Figure 6: Capacitance Characteristics

RATINGS AND CHARACTERISTIC CURVES

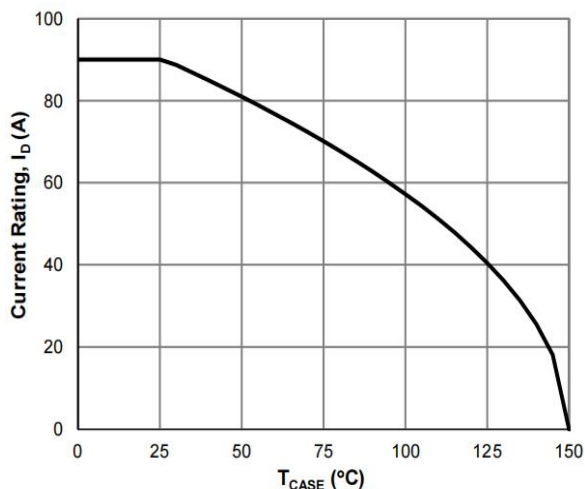


Figure 7: Current De-rating

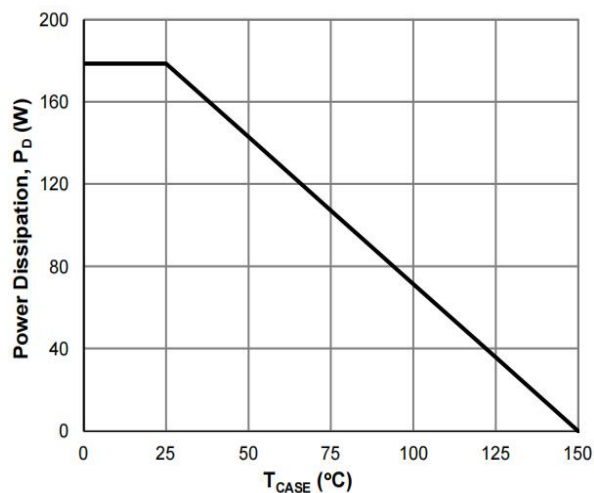


Figure 8: Power De-rating

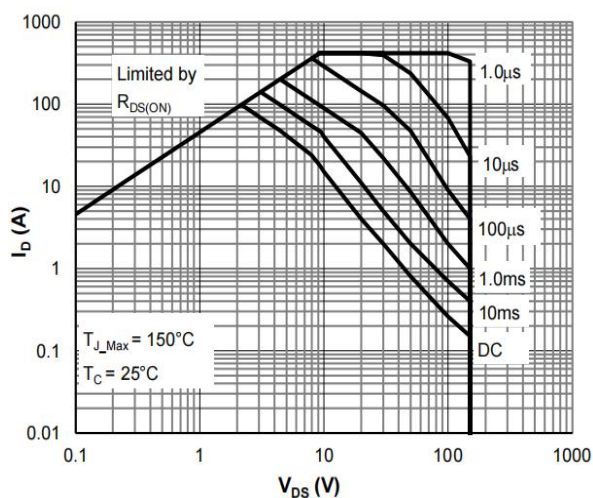


Figure 9: Maximum Safe Operating Area

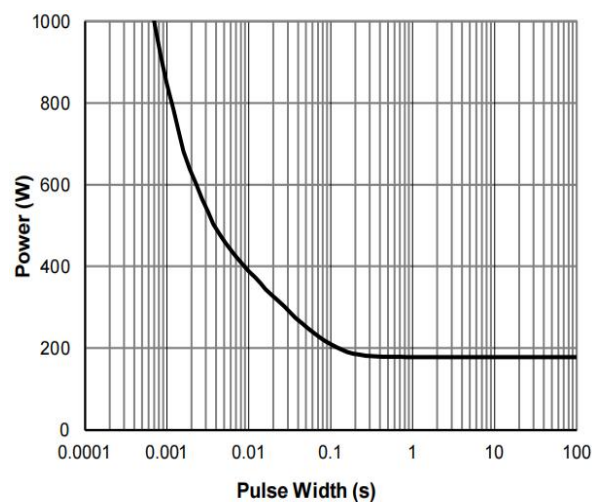


Figure 10: Single Pulse Power Rating, Junction-to-Case

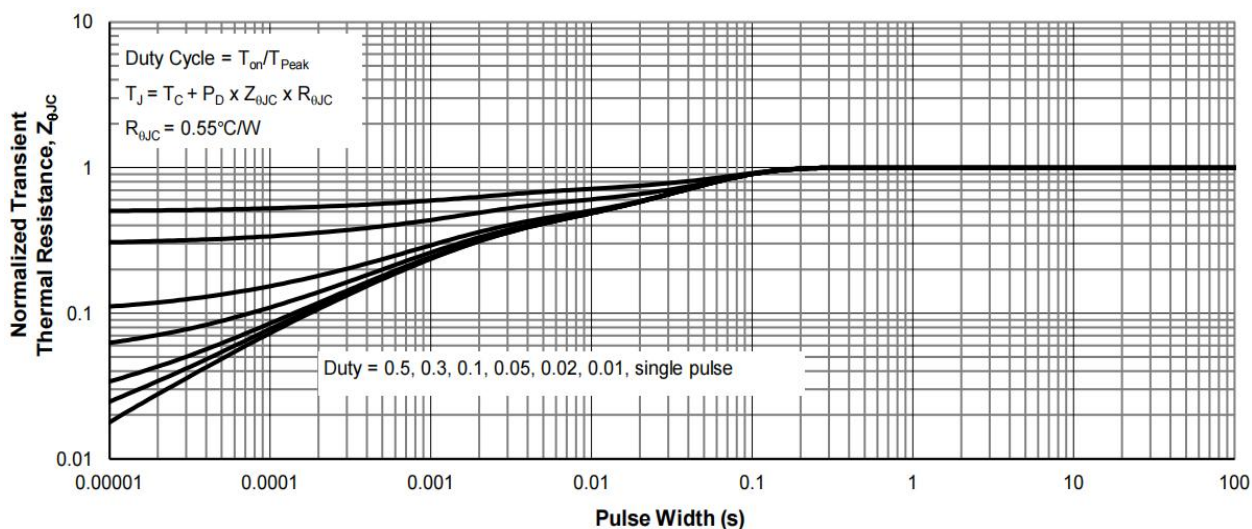
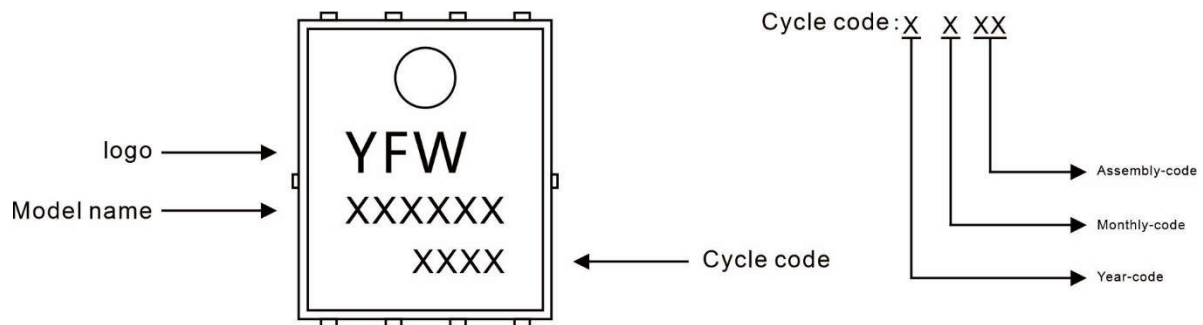


Figure 11: Normalized Maximum Transient Thermal Impedance

Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWG90N15NF	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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