

85V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	150A
V_{DSS}	85V
R_{DS(on)-typ}(@V_{GS}=10V)	<4mΩ(Typ:3.0 mΩ)

Features

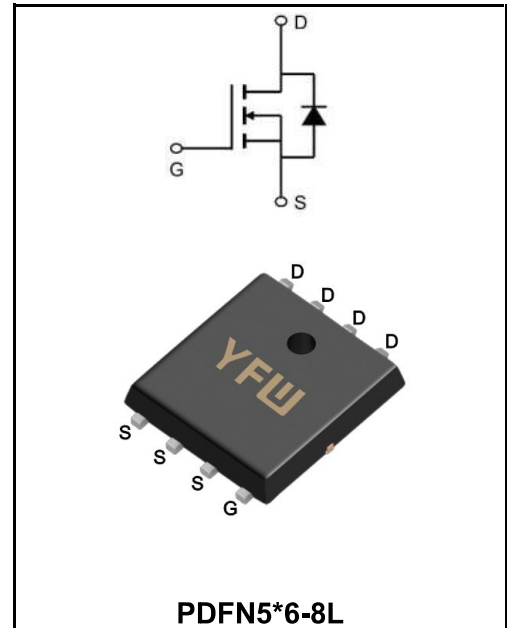
- ◆ **YFW-SGT technology**
- ◆ Ultra-low RDS(ON)
- ◆ Low Gate Charge
- ◆ Halogen-free and RoHS-compliant

Application

- ◆ Motor Driving in Power Tool, E-vehicle, Robotics
- ◆ Current Switching in DC/DC & AC/DC (SR) Sub-systems
- ◆ Power Management in Telecom., Industrial Automation, CE

MECHANICAL DATA

- ◆ Case: Molded plastic
- ◆ 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}	85	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous drain current	I_D	150	A
Pulsed Drain Current (Note1)	I_{DM}	515	A
Power dissipation	P_D	192	W
Single Pulse Avalanche Energy(Note1)	E_{AS}	434	mJ
Operation and storage temperature	T_{STG}, T_J	-55 to +150	°C
Thermal Resistance, Junction-case	R_{θJC}	0.65	°C/W
Thermal Resistance, Junction to Ambient	R_{θJA}	45	°C/W

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

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	85	-	-	V
Drain-Source Leakage Current	$V_{DS}=80V, V_{GS}=0V$	I_{DSS}	-	-	1	μA
Gate-Source Leakage Current	$V_{GS} = \pm 20 V, V_{DS} = 0 V$	I_{GSS}	-	-	± 100	nA
Gate -Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	2	-	4	V
Drain-Source On-State Resistance	$V_{GS} = 10 V, I_D = 20 A$	$R_{DS(ON)}$	-	3	4	m Ω
Forward Transconductance	$V_{DS} = 5 V, I_D = 20 A$	g_{fs}	-	43	-	S
Input Capacitance	$V_{GS}=0V$ $V_{DS}=40V$ $f=1MHz$	C_{iss}	-	4083	-	pF
Output Capacitance		C_{oss}	-	1313	-	
Reverse Transfer Capacitance		C_{rss}	-	42	-	
Turn-on delay time	$V_{GS} = 10V,$ $V_{DS} = 40V$ $RL = 2.0\Omega$ $RGEN = 3\Omega$	$t_{d(on)}$	-	18.9	-	ns
Rise Time		T_r	-	28	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	38	-	
Fall Time		t_f	-	13.1	-	
Total Gate Charge	$I_D=20A$ $V_{DS}=40V$ $V_{GS}=10V$	Q_g	-	62	-	nC
Gate-Source Charge		Q_{gs}	-	21	-	
Gate-Drain Charge		Q_{gd}	-	13.8	-	
Maximun Body-Diode Continuous Current		I_S	-	-	150	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	515	A
Diode Forward Voltage	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	V_{SD}	-	-	1	V
Reverse Recovery Time	$I_S = I_F, I_{SD}=20A, V_{GS} = 0 V,$ $di / dt = 100 A/\mu s$	t_{rr}	-	57	-	ns
Reverse Recovery Charge		Q_{rr}	-	85	-	nC

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

Ratings and Characteristic Curves

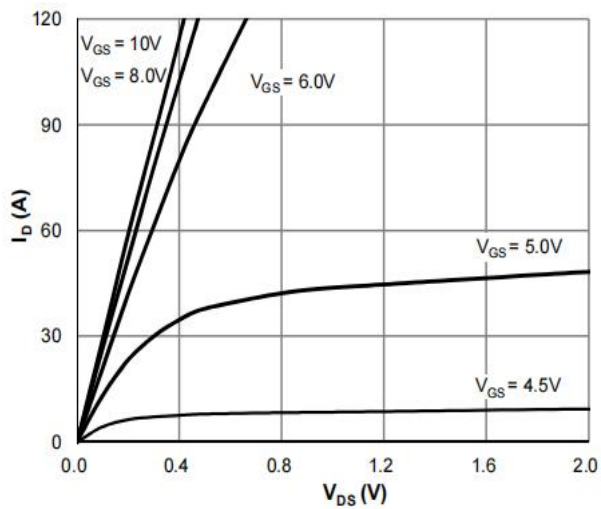


Figure 1: Saturation Characteristics

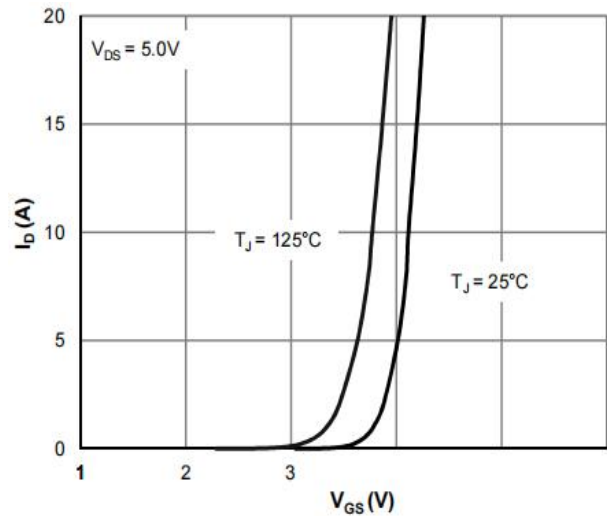


Figure 2: Transfer Characteristics

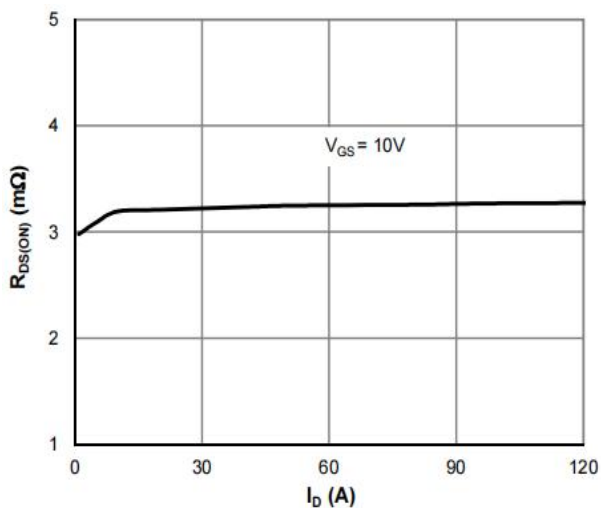


Figure 3: $R_{DS(ON)}$ vs. Drain Current

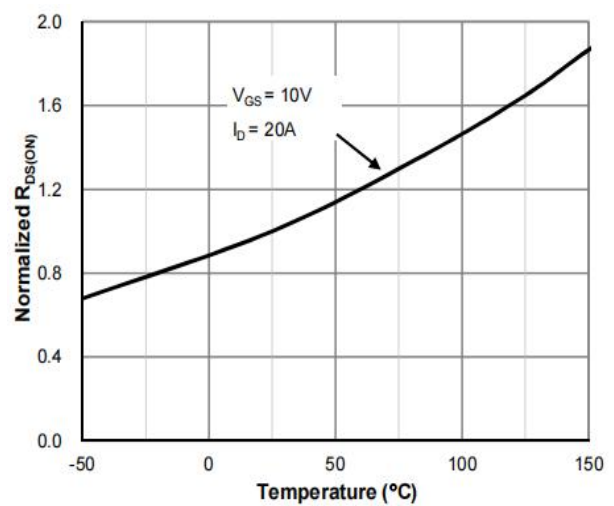


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

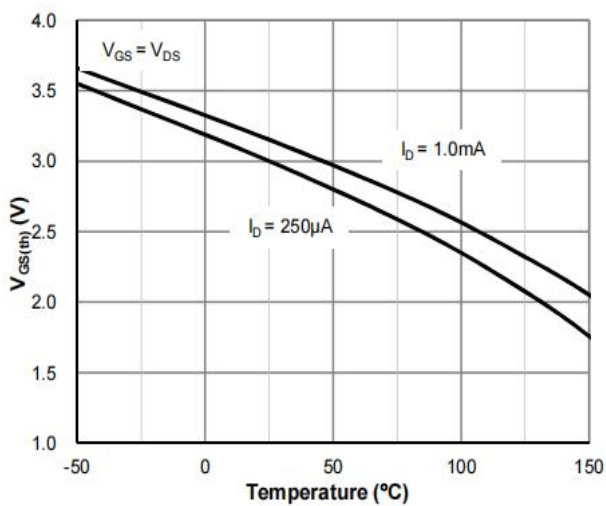


Figure 5: $V_{GS(th)}$ vs. Junction Temperature

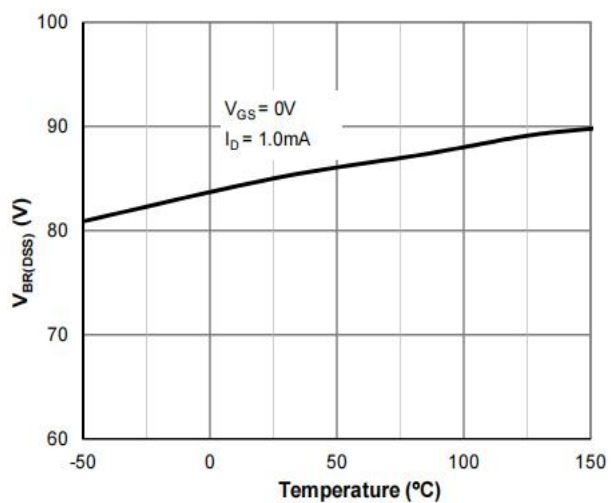


Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature

Ratings and Characteristic Curves

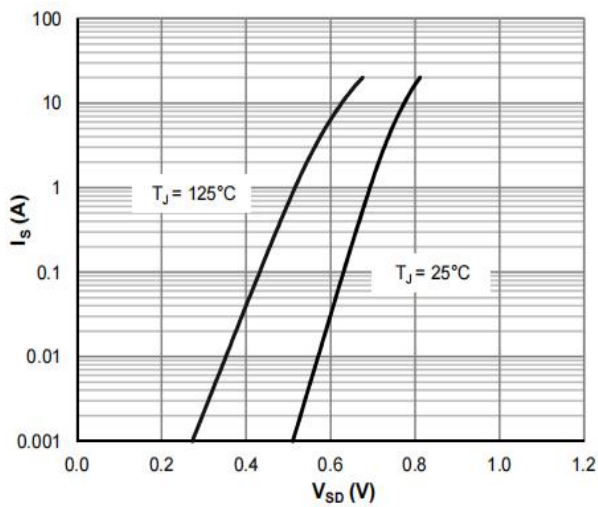


Figure 7: Body-Diode Characteristics

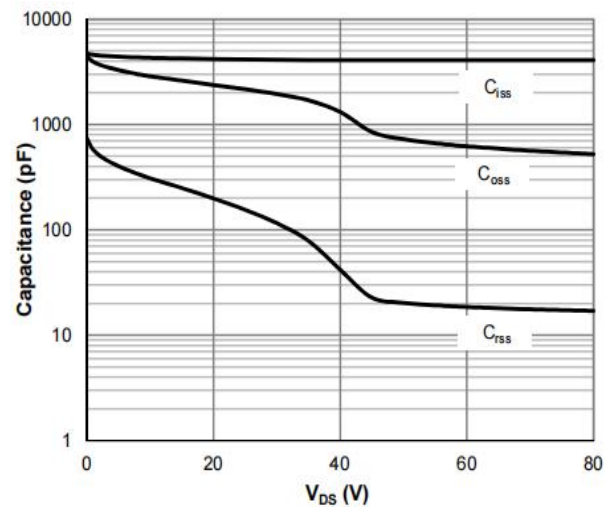


Figure 8: Capacitance Characteristics

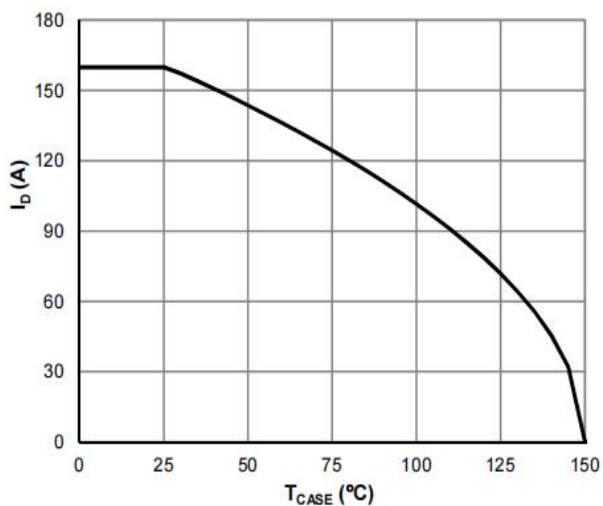


Figure 9: Current De-rating

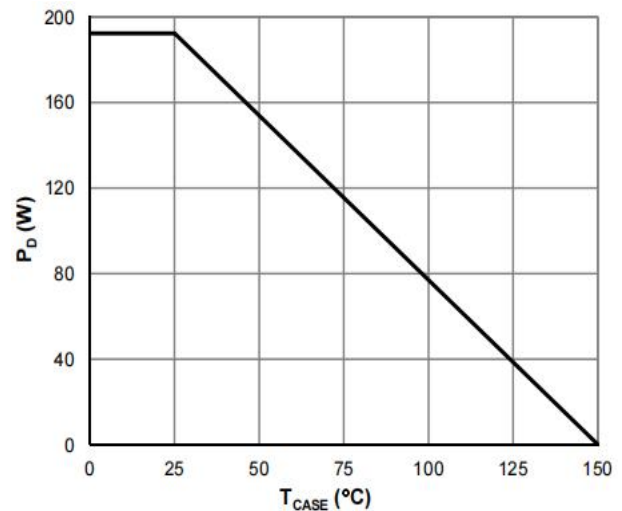


Figure 10: Power De-rating

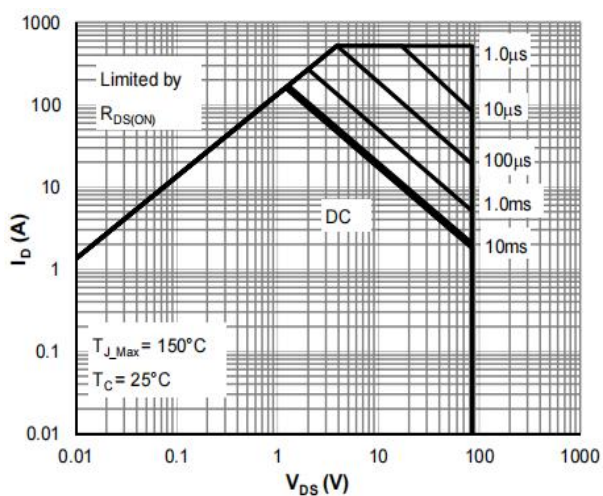


Figure 11: Maximum Safe Operating Area

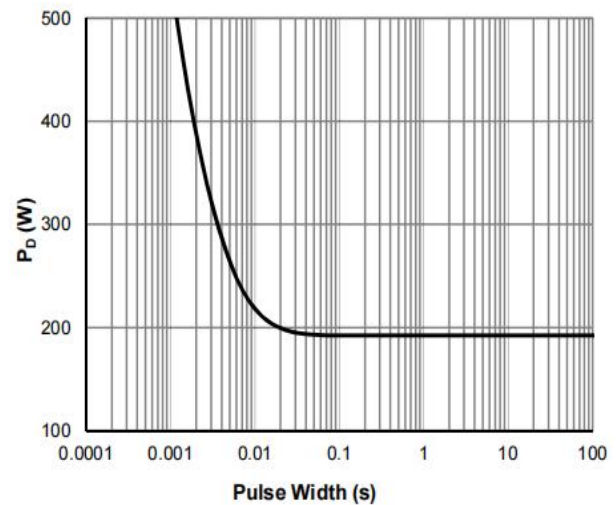
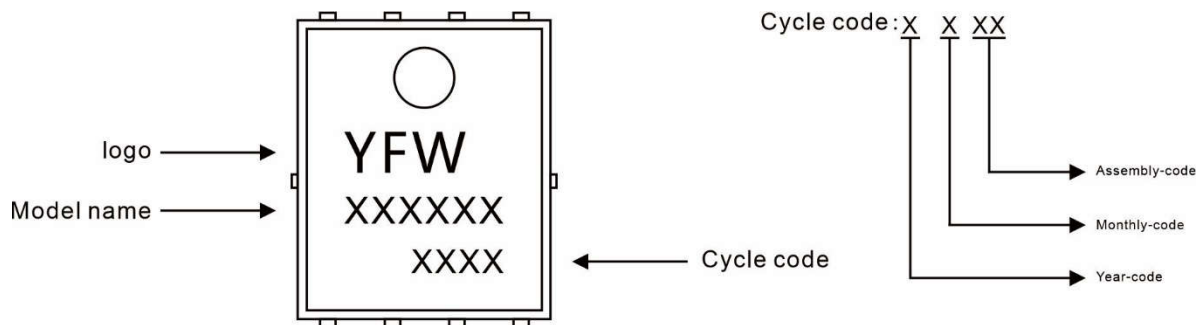


Figure 12: Single Pulse Power Rating, Junction-to-Case

Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWG150N085NF	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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