

100V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	120A
V_{DSS}	85V
R_{DS(on)-typ}(@V_{GS}=10V)	<5.0mΩ(Typ:4.5 mΩ)

FEATURES

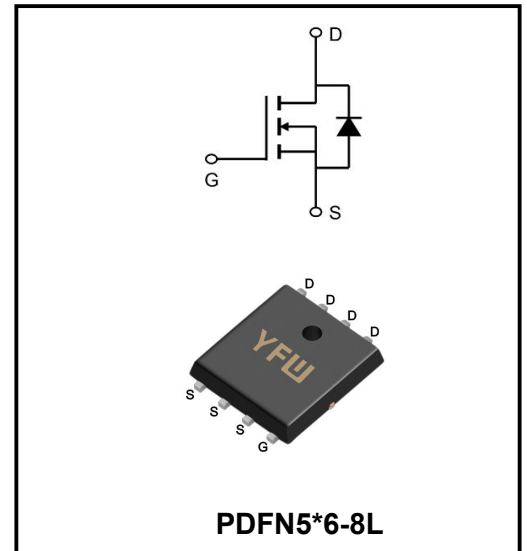
- ♦Ultra-low RDS(ON)
- ♦Low Gate Charge
- ♦100% UIS Tested, 100% RgTested
- ♦Pb-free Lead Plating
- ♦Halogen-free and RoHS-compliant
- ♦**YFW-SGT technology**

APPLICATIONS

- ♦Motor Driving in Power Tool, E-vehicle, Robotics
- ♦Current Switching in DC/DC &AC/DC (SR) Sub-syste
- ♦Power Management in Telecom., Industrial ment 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
Continue Drain Current	I_D	120	A
Pulsed Drain Current (Note1)	I_{DM}	465	A
Total Power Dissipation	P_D	208	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	500	mJ
Operating Junction Temperature Range	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Thermal Resistance, Junction to Case	R_{θJC}	0.6	°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 Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	-	-	± 100	nA
Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	2.0	-	4.0	V
Drain-Source on-Resistance	$V_{GS}=10V, I_D=20A$	$R_{DS(on)}$	-	4.5	5.0	m Ω
Forward Transconductance	$V_{DS}=5V, I_D=20A$	g_{fs}	-	31	-	S
Gate Resistance	$V_{GS}=0V, V_{DS}=0V, f=1MHz$	R_g	-	1.9	-	Ω
Input Capacitance	$V_{DS}=40V$ $V_{GS}=0V$ $f=1MHz$	C_{iss}	-	4010	-	pF
Output Capacitance		C_{oss}	-	1264	-	
Reverse Transfer Capacitance		C_{rss}	-	46	-	
Total Gate Charge	$V_{GS}=10V$ $V_{DS}=40V$ $I_D=20A$	Q_g	-	56	-	nC
Gate-Source Charge		Q_{gs}	-	18.3	-	
Gate-Drain Charge		Q_{gd}	-	15	-	
Turn-on delay time	$V_{GS}=10V$ $V_{DS}=40V$ $R_L=2.0\Omega$ $R_{GEN}=3\Omega$	$t_{d(on)}$	-	17.6	-	ns
Rise Time		T_r	-	27	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	31	-	
Fall Time		t_f	-	10.8	-	
Maximun Body-Diode Continuous Current		I_S	-	-	120	A
Diode Forward Voltage	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	V_{SD}	-	0.7	1.0	V
Body Diode Reverse Recovery Time(Note2)	$T_J=25^\circ C, I_F=20A$ $di/dt=100A/\mu s$	t_{rr}	-	58	-	ns
Body Diode Reverse Recovery Charge(Note2)		Q_{rr}	-	95	-	nC

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

Ratings and Characteristic Curves

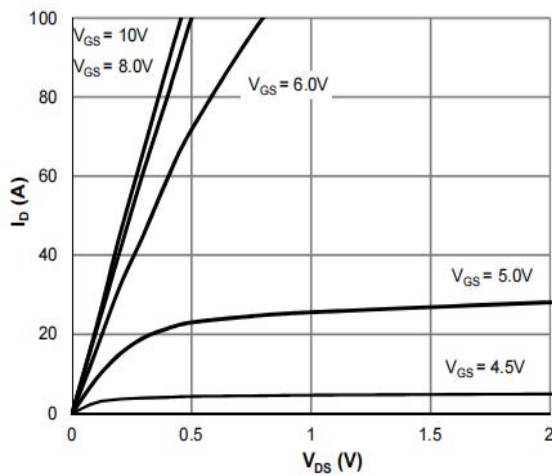


Figure 1: Saturation Characteristics

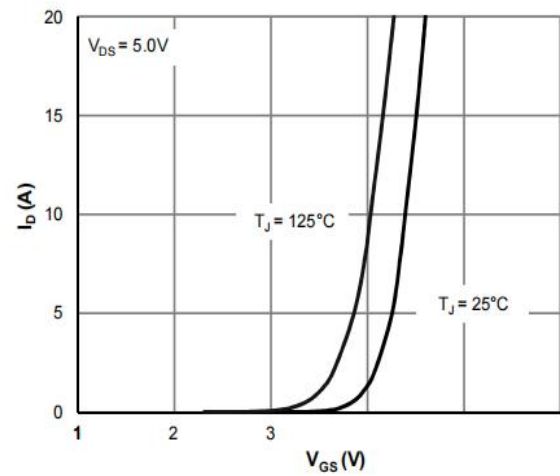


Figure 2: Transfer Characteristics

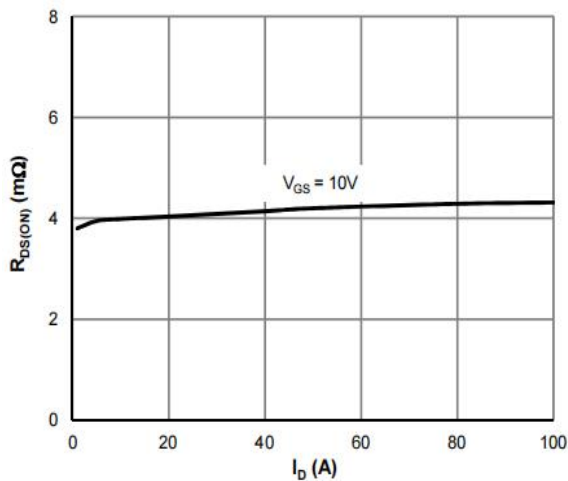


Figure 3: $R_{DS(ON)}$ vs. Drain Current

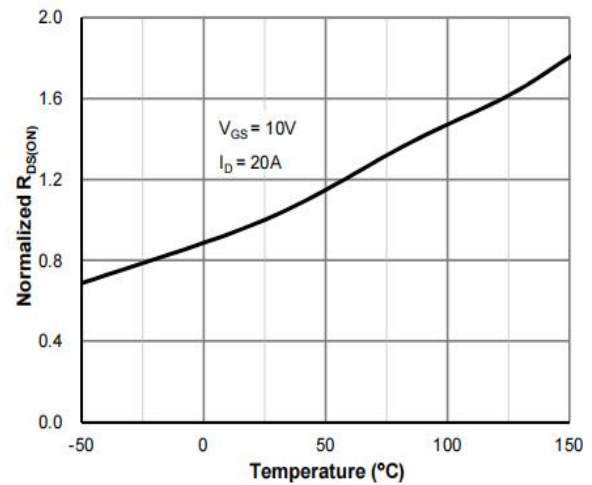


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

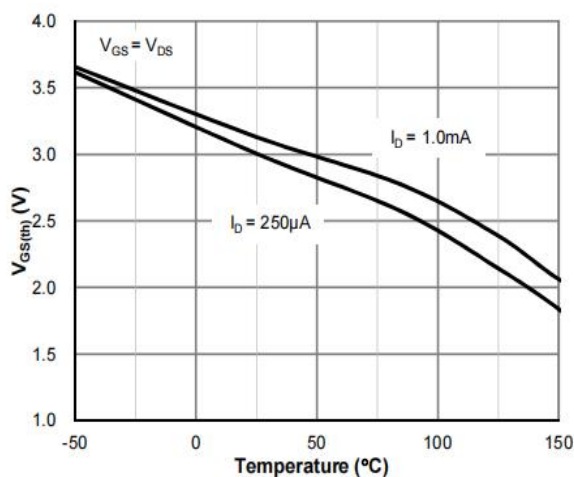


Figure 5: $V_{GS(th)}$ vs. Junction Temperature

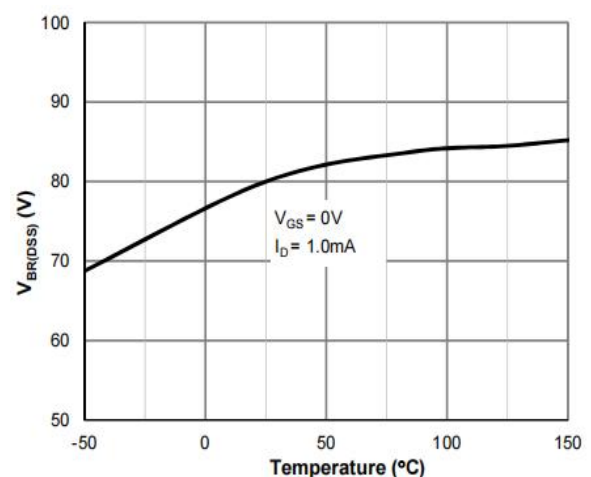


Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature

Ratings and Characteristic Curves

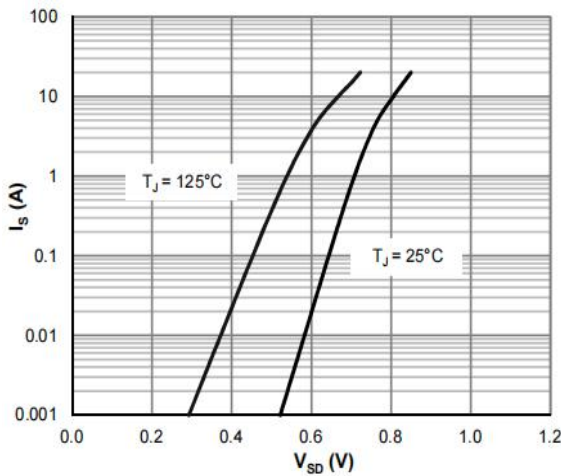


Figure 7: Body-Diode Characteristics

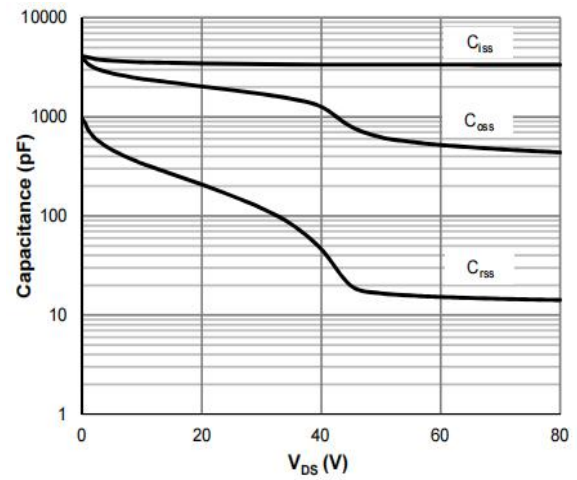


Figure 8: Capacitance Characteristics

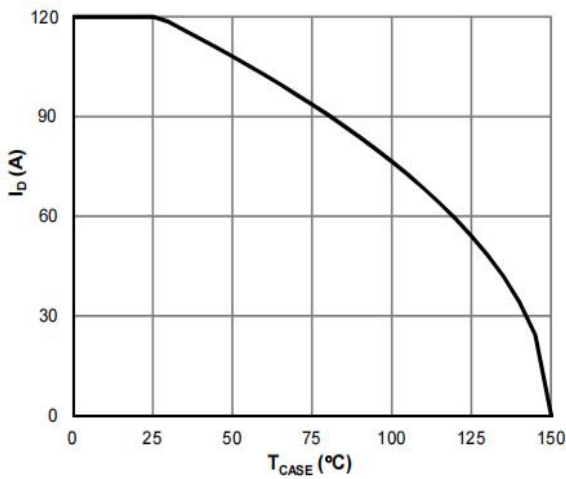


Figure 9: Current De-rating

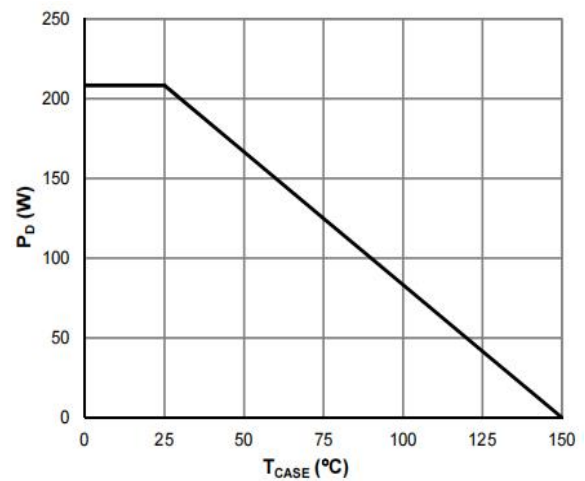


Figure 10: Power De-rating

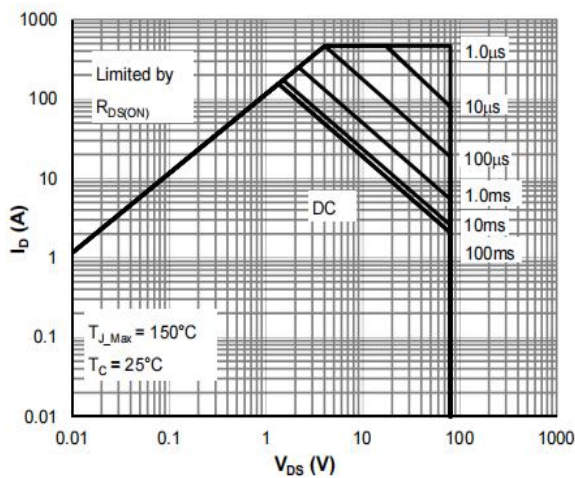


Figure 11: Maximum Safe Operating Area

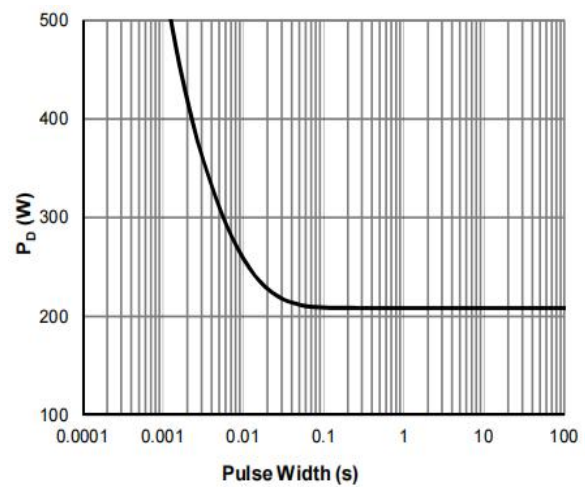
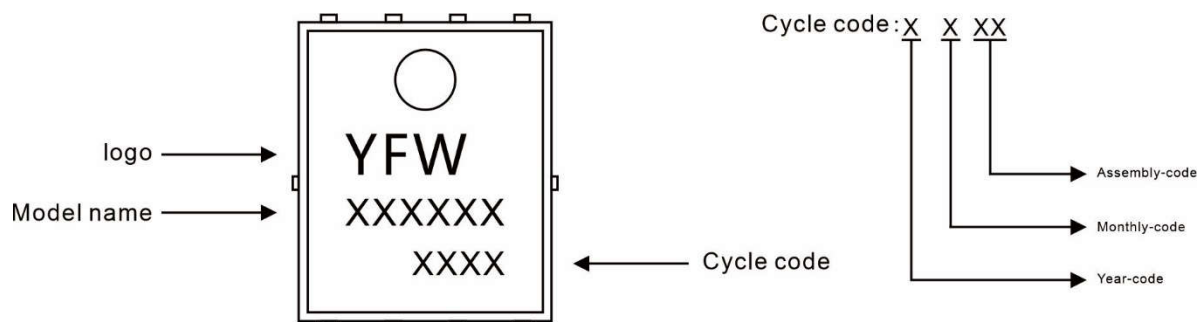


Figure 12: Single Pulse Power Rating, Junction-to-Case

Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWG120N085NF	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	43
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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