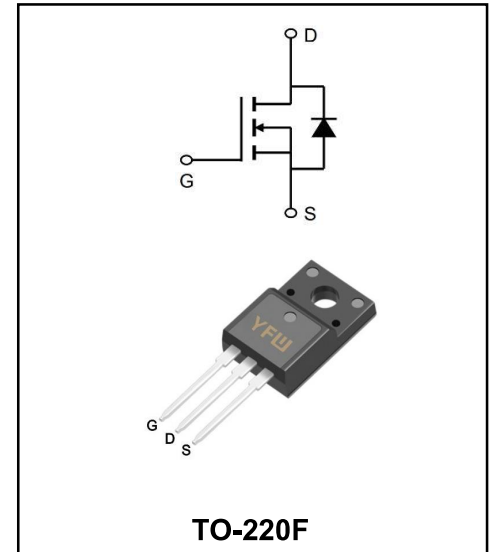


85V N-Channel SGT Power MOSFET

MAIN CHARACTERISTICS

I_D	150A
V_{DS}	85V
R_{DS(on)}-typ(@V_{GS}=10V)	< 5.0mΩ (Typ: 3.9mΩ)



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

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
Operating Temperature Range	T_J	150	°C
Storage Temperature Rang	T_{STG}	-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	$V_{GS} = \pm 20V, V_{DS} = 0V$	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	$V_{GS} = 10V, I_D = 20A$	$R_{DS(on)}$	-	3.9	5.0	m Ω
Forward Transconductance	$V_{DS} = 5V, I_D = 20A$	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	$V_{GS} = 10V,$ $V_{DS} = 40V$ $RL = 2.0\Omega$ $R_{GEN} = 3\Omega$	$t_{d(on)}$	-	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	$I_S = I_F, I_{SD}=20A, V_{GS} = 0V,$ $di/dt = 100 A/\mu s$	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

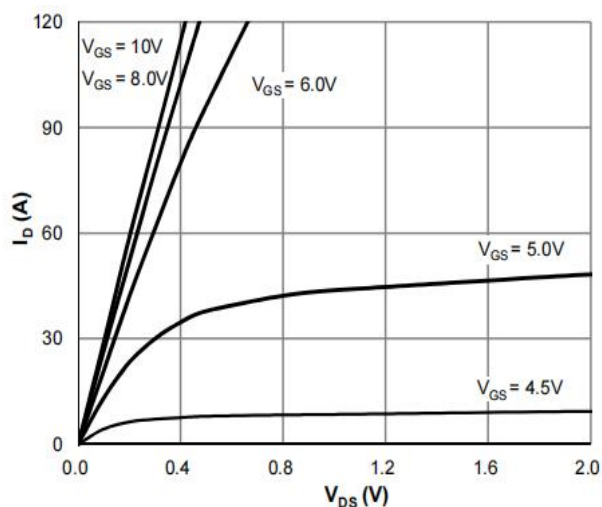


Figure 1: Saturation Characteristics

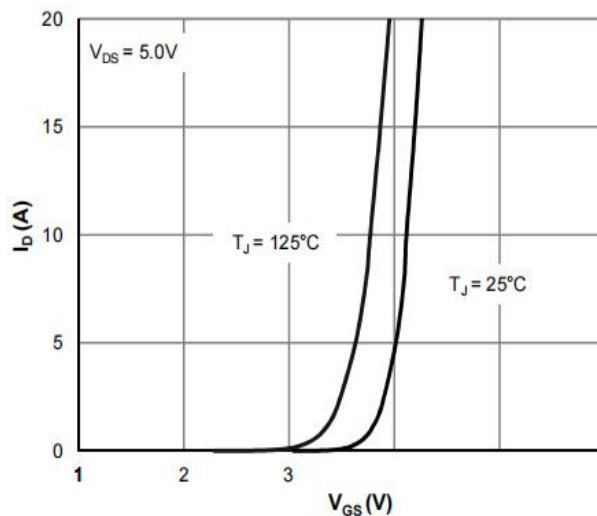


Figure 2: Transfer Characteristics

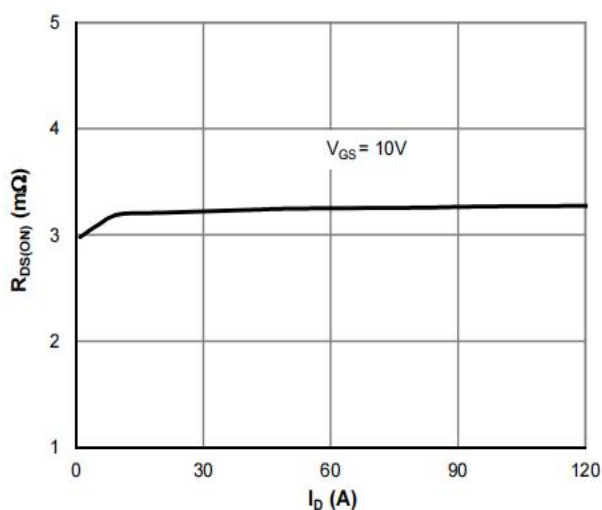


Figure 3: $R_{DS(ON)}$ vs. Drain Current

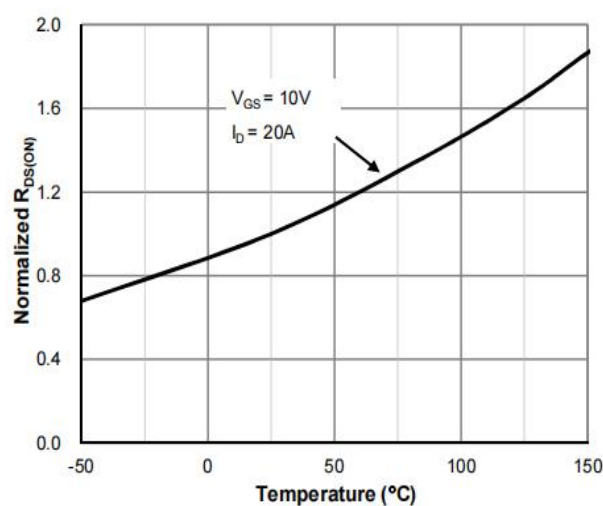


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

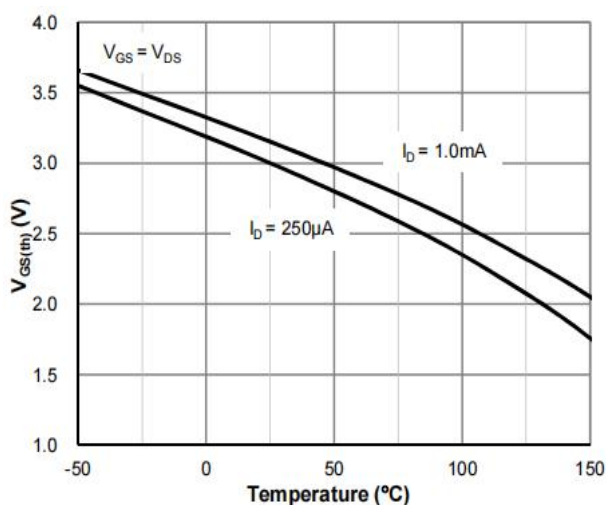


Figure 5: $V_{GS(th)}$ vs. Junction Temperature

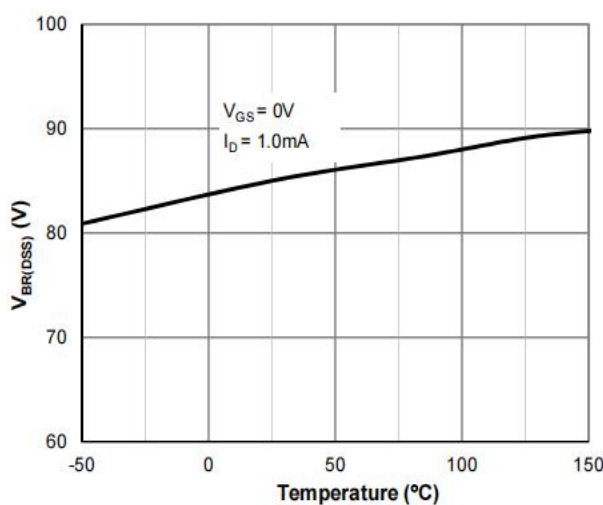


Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature

Ratings and Characteristic Curves

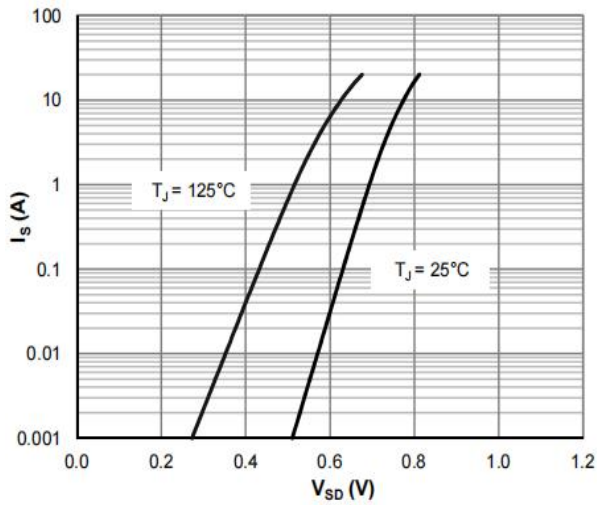


Figure 7: Body-Diode Characteristics

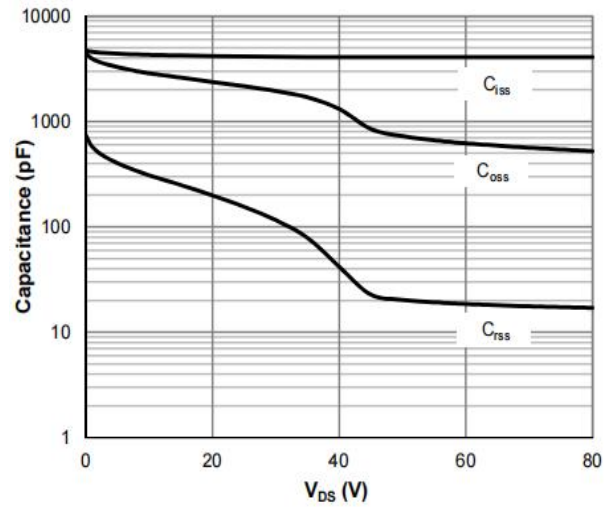


Figure 8: Capacitance Characteristics

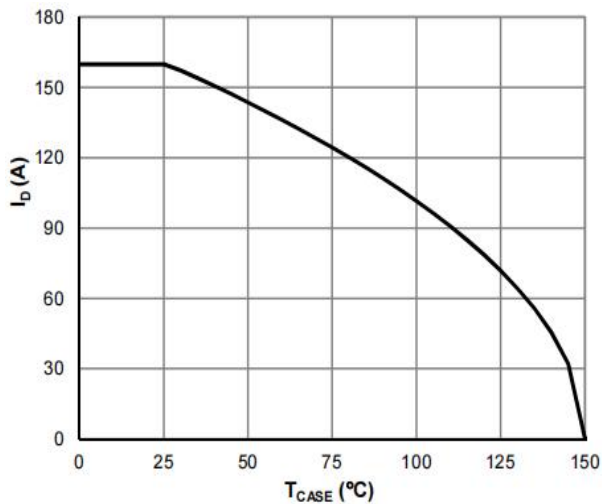


Figure 9: Current De-rating

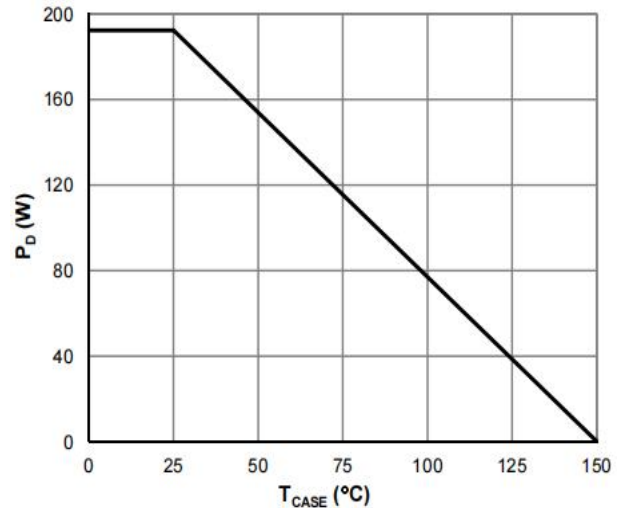


Figure 10: Power De-rating

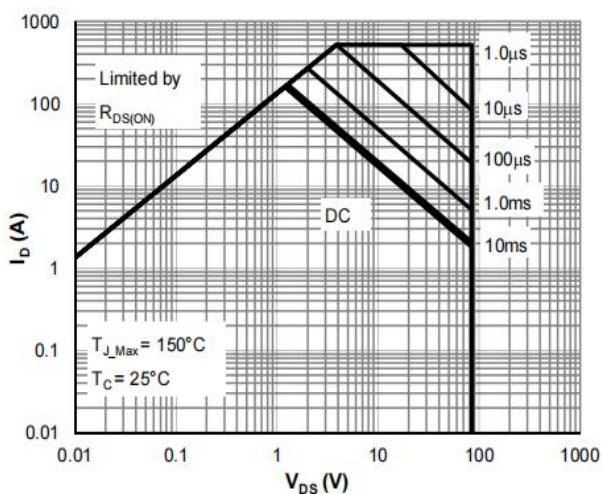


Figure 11: Maximum Safe Operating Area

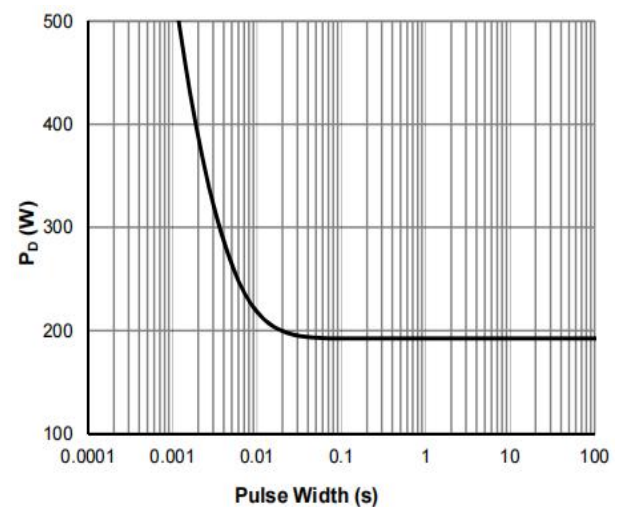
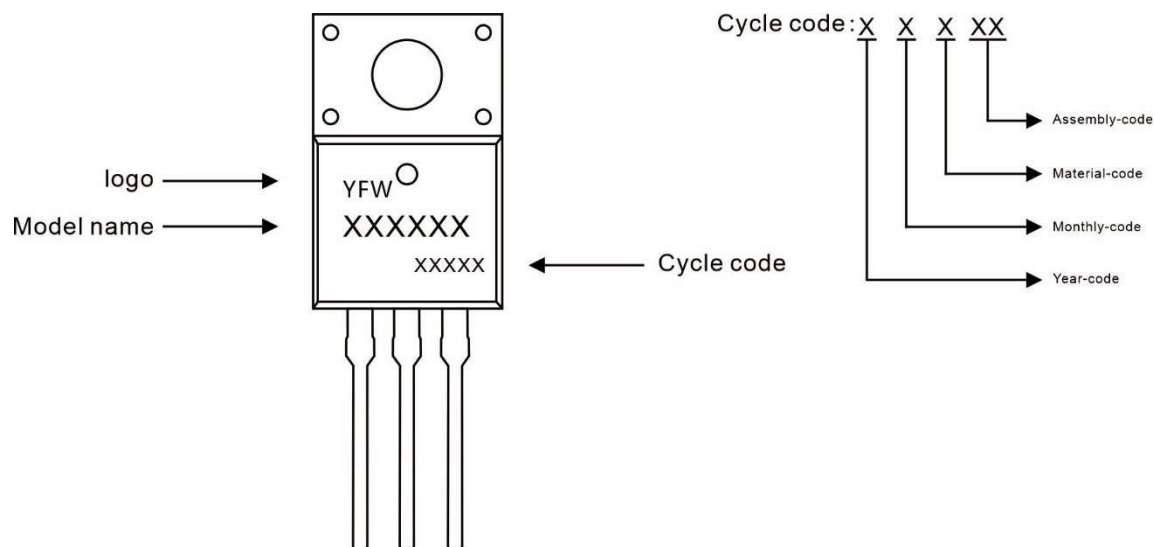


Figure 12: Single Pulse Power Rating, Junction-to-Case

Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWG150N085AF	TO-220F	0.06oz(1.74g)	50pcs/tube	1000PCS/Box 5000PCS/Carton

Package Dimensions

TO-220F

Symbol	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.50	4.90	0.177	0.193
A1	2.34	2.74	0.092	0.108
A2	2.66	2.86	0.105	0.113
b	0.75	0.85	0.030	0.033
b1	1.24	1.44	0.049	0.057
c	0.40	0.60	0.016	0.024
D	10.00	10.32	0.394	0.406
E	15.75	16.05	0.620	0.632
e	2.44	2.64	0.096	0.104
e1	4.88	5.28	0.192	0.208
F	3.10	3.5	0.122	0.138
L	13.50	13.90	0.531	0.547
L1	2.90	3.30	0.114	0.130
Φ	3.10	3.30	0.122	0.130

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