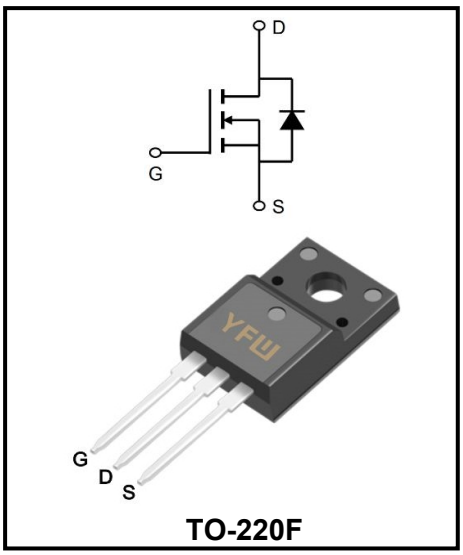
150V N- Channel SGT Power MOSFET

MAIN CHARACTERISTICS

I_D	50A
V_{DS}	150V
R_{DSON}-typ(@V_{GS}=10V)	＜18.8mΩ(Typ:14.5mΩ)



TO-220F

FEATURES

- Ultra-Low RDS(ON)
- Low Gate Charge
- High Current Capability
- YFW-SGT technology

APPLICATION

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

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	150	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous drain current	I_D	50	A
Pulsed Drain Current (Note1)	I_{DM}	200	A
Power Dissipation	P_D	96	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	330	mJ
Operating Temperature Range	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Thermal Resistance Junction-Case	$R_{\theta JC}$	3.2	°C/W
Thermal Resistance, Junction--Ambient	$R_{\theta JA}$	75	°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=250uA	BV_{DSS}	150	-	-	V
Drain-Source Leakage Current	V_{DS}=150V , V_{GS}=0V	I_{DSS}	-	-	1	μA
Gate-Source Leakage Current	V_{GS} = ± 20 V, V_{DS} = 0 V	I_{GSS}	-	-	±100	nA
Gate-Source Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	$V_{GS(th)}$	2.2	-	4.2	V
Drain-source on-state resistance	V_{GS}=10V, I_D=20A	$R_{DS(ON)}$	-	14.5	18.8	mΩ
Input Capacitance	V_{GS}=0V V_{DS}=75V f=1MHz	C_{iss}	-	2500	-	pF
Output Capacitance		C_{oss}	-	210	-	
Reverse Transfer Capacitance		C_{rss}	-	20	-	
Turn-on delay time(Note2)	V_{DD}=75V V_{GS}=10V R_G=6Ω I_D=20 A	$t_{d(on)}$	-	7.1	-	ns
Rise Time(Note2)		T_r	-	8.4	-	
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	17	-	
Fall Time(Note2)		t_f	-	11	-	
Total Gate Charge(Note2)	I_D=20A V_{DS}=75V V_{GS}=10V	Q_g	-	23	-	nC
Gate-Source Charge(Note2)		Q_{gs}	-	7.7	-	
Gate-Drain Charge(Note2)		Q_{gd}	-	4.7	-	
Maximun Body-Diode Continuous Current		I_S	-	-	50	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	200	A
Drain-Source Diode Forward Voltage	V_{GS}=0V , I_S=20A , T_J=25℃	V_{SD}	-	-	1.2	V
Reverse Recovery Time(Note2)	T_J = 25℃, I_F= 20A di / dt = 100 A/μs	t_{rr}	-	86	-	ns
Reverse Recovery Charge(Note2)		Q_{rr}	-	137	-	nC

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

Ratings and Characteristic Curves

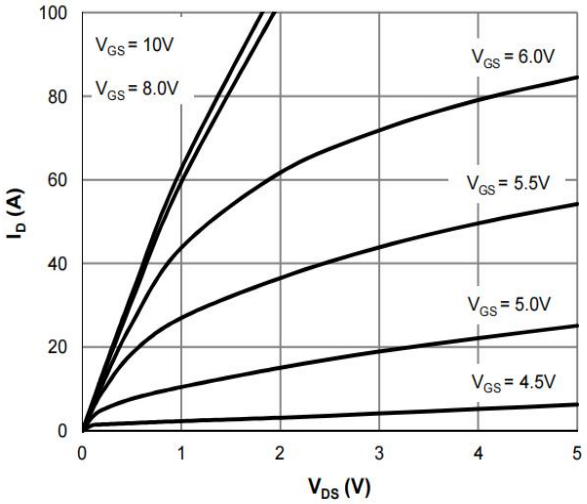


Figure 1: Saturation Characteristics

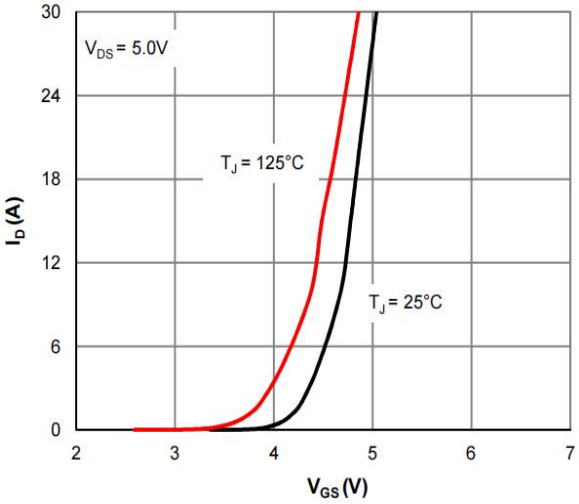


Figure 2: Transfer Characteristics

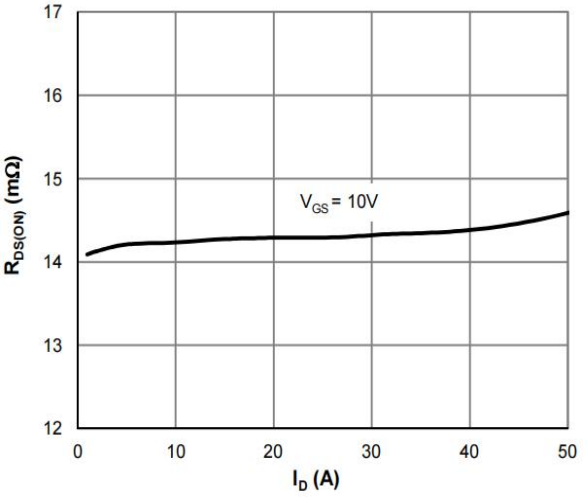


Figure 3: $R_{DS(ON)}$ vs. Drain Current

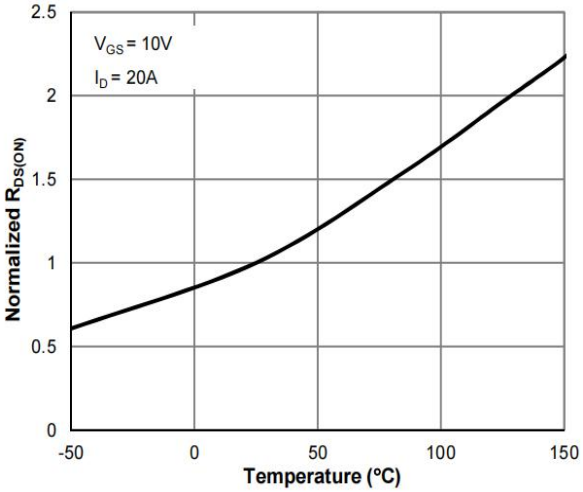


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

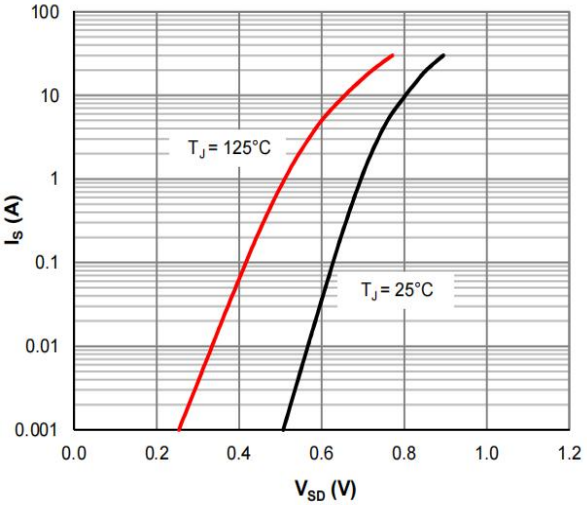


Figure 5: Body-Diode Characteristics

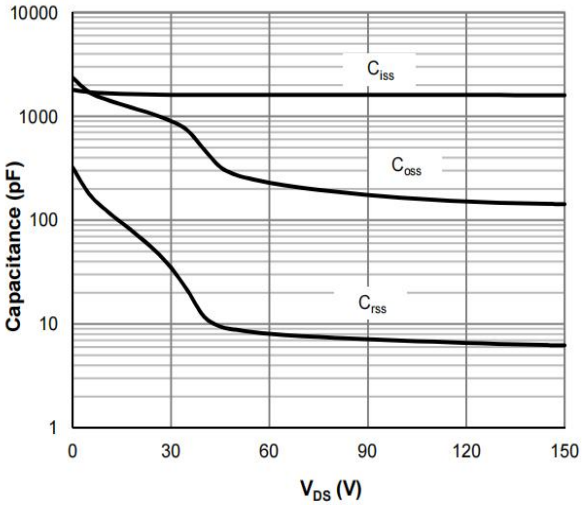


Figure 6: Capacitance Characteristics

Ratings and Characteristic Curves

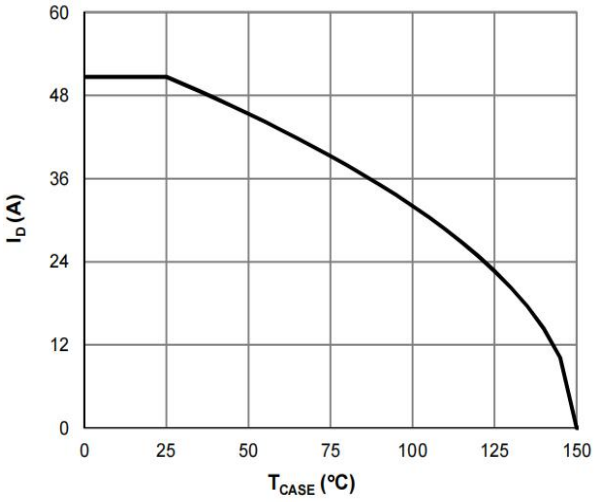


Figure 7: Current De-rating

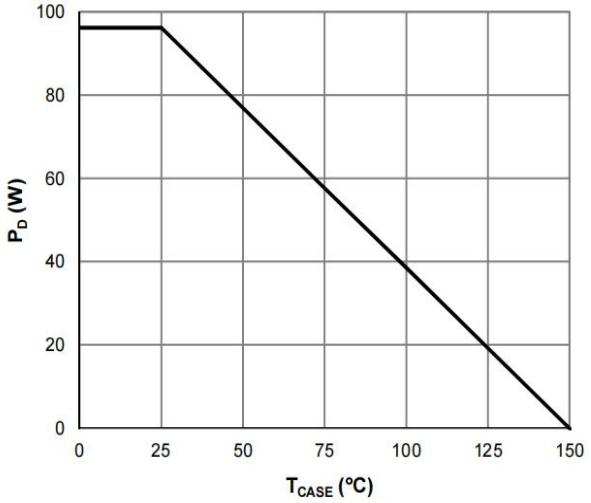


Figure 8: Power De-rating

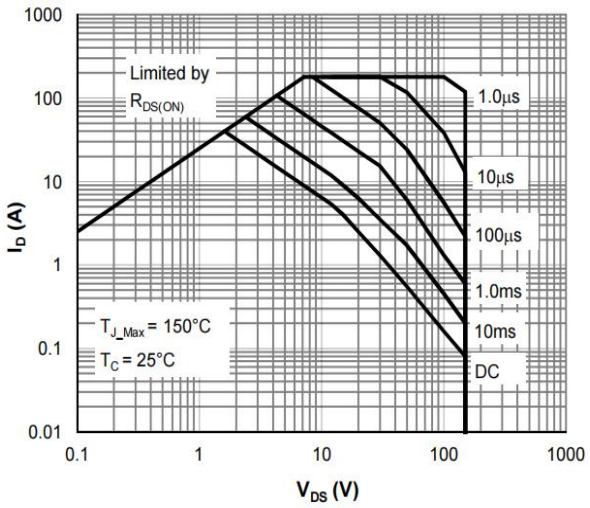


Figure 9: Maximum Safe Operating Area

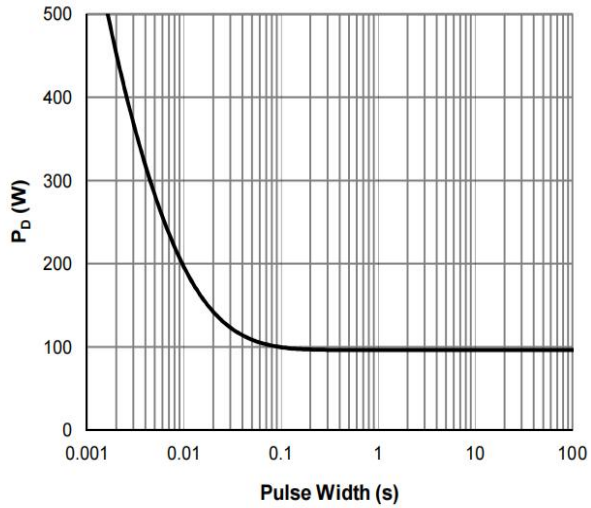


Figure 10: Single Pulse Power Rating, Junction-to-Case

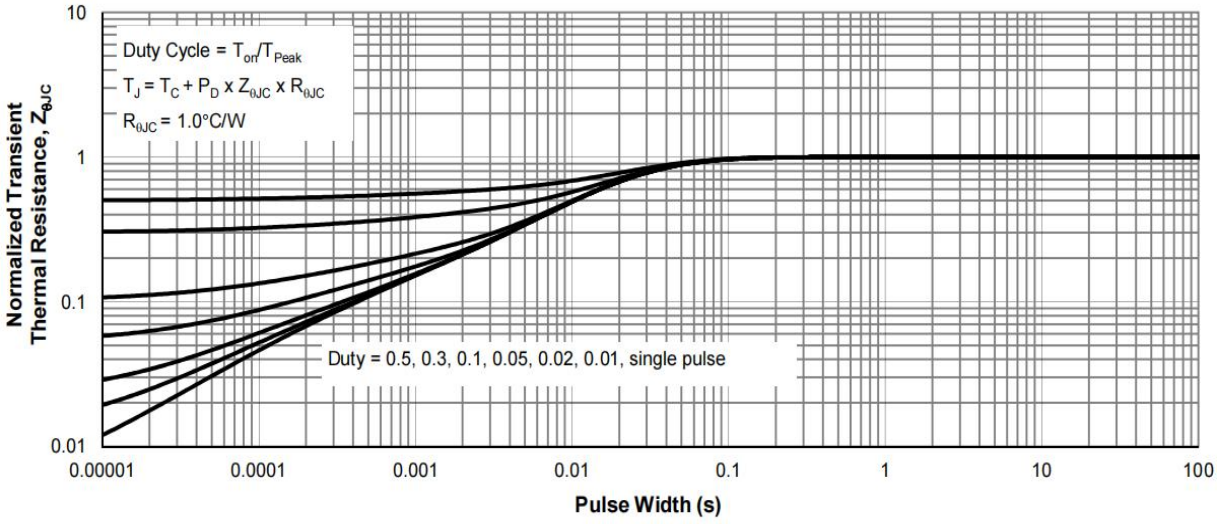
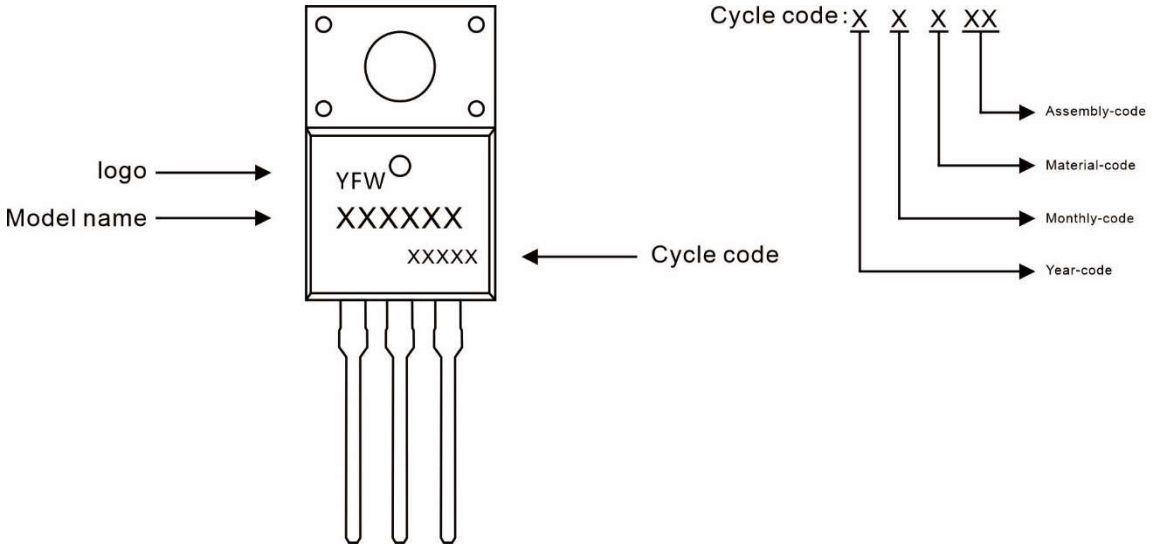


Figure 11: Normalized Maximum Transient Thermal Impedance

Marking Diagram

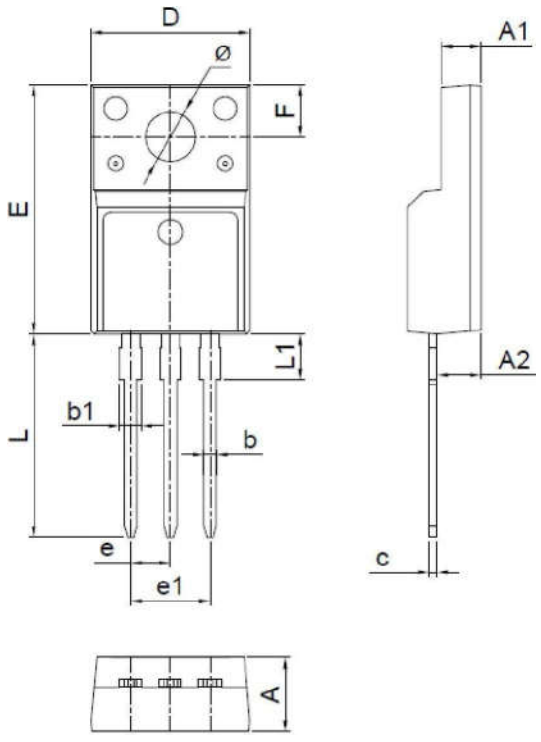


Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWG50N15AF	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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