

120V N- Channel SGT Power MOSFET

MAIN CHARACTERISTICS

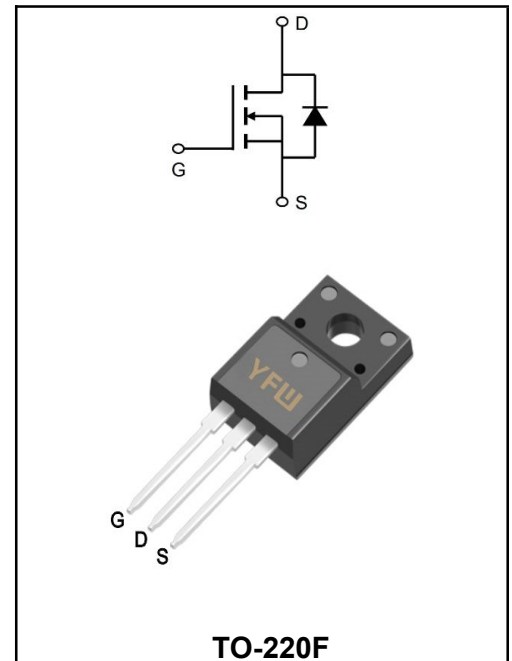
I_D	80A
V_{DS}	120V
R_{DS(on)-typ(@V_{GS}=10V)}	<6.1mΩ(Typ:5.1mΩ)

FEATURES

- ♦Best-in-Class FOM
- ♦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}	120	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous drain current	I_D	80	A
Pulsed Drain Current (Note1)	I_{DM}	320	A
Power Dissipation	P_D	95	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	130	mJ
Operating Temperature Range	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Thermal Resistance Junction-Case	R_{θJC}	2.9	°C/W
Thermal Resistance, Junction--Ambient	R_{θJA}	62	°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}	120	-	-	V
Drain-Source Leakage Current	$V_{DS}=120V, V_{GS}=0V$	I_{DSS}	-	-	1	μA
Gate-Source Leakage Current	$V_{GS} = \pm 20V, V_{DS} = 0V$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	1.0	-	2.5	V
Drain-source on-state resistance	$V_{GS}=10V, I_D=45A$	$R_{DS(on)}$	-	5.1	6.1	m Ω
	$V_{GS}=4.5V, I_D=35A$		-	6.7	8.0	
Input Capacitance	$V_{GS}=0V$ $V_{DS}=50V$ $f=1MHz$	C_{iss}	-	2356	-	pF
Output Capacitance		C_{oss}	-	750	-	
Reverse Transfer Capacitance		C_{rss}	-	80	-	
Turn-on delay time(Note2)	$V_{DD}=50V$ $V_{GS}=10V$ $R_G=3\Omega$ $I_D=20A$	$t_{d(on)}$	-	17	-	ns
Rise Time(Note2)		T_r	-	6.5	-	
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	45.3	-	
Fall Time(Note2)		t_f	-	23	-	
Total Gate Charge(Note2)	$I_D=20A$ $V_{DS}=50V$ $V_{GS}=10V$	Q_g	-	42.5	-	nC
Gate-Source Charge(Note2)		Q_{gs}	-	13	-	
Gate-Drain Charge(Note2)		Q_{gd}	-	10	-	
Maximun Body-Diode Continuous Current		I_S	-	-	80	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	320	A
Drain-Source Diode Forward Voltage	$V_{GS}=0V, I_S=30A, T_J=25^\circ C$	V_{SD}	-	-	1.2	V
Reverse Recovery Time(Note2)	$T_J = 25^\circ C, I_F = 20A$ $di / dt = 100 A/\mu s$	t_{rr}	-	61	-	ns
Reverse Recovery Charge(Note2)		Q_{rr}	-	88	-	nC

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

Ratings and Characteristic Curves

Figure 1. Output Characteristics

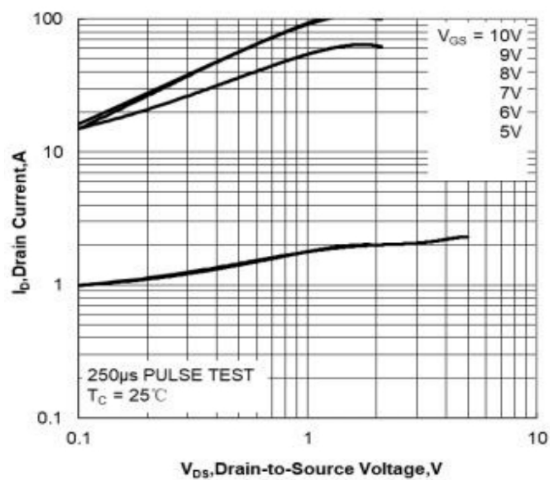


Figure 2. Transfer Characteristics

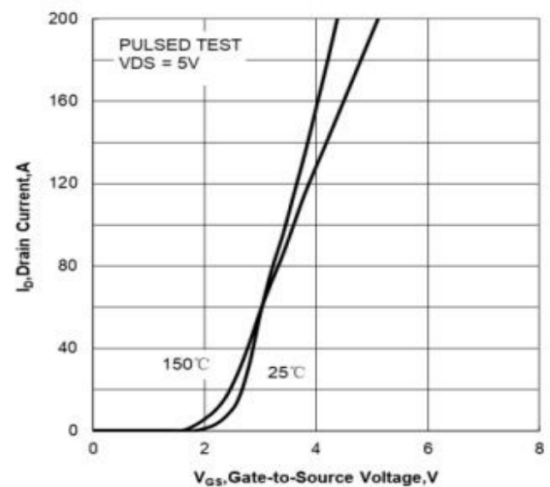


Figure 3. Drain-to-Source On Resistance vs Drain Current

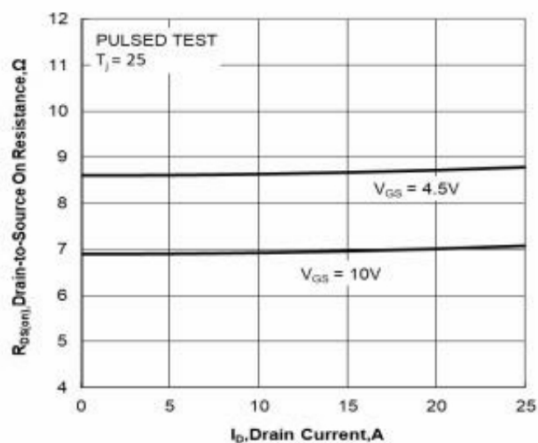


Figure 4. Body Diode Forward Voltage vs Source Current and Temperature

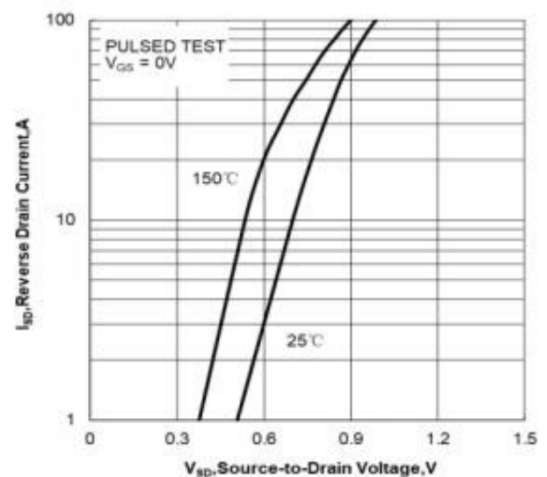


Figure 5. Capacitance Characteristics

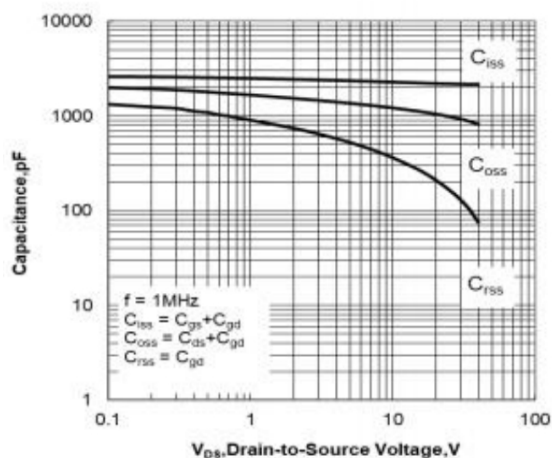
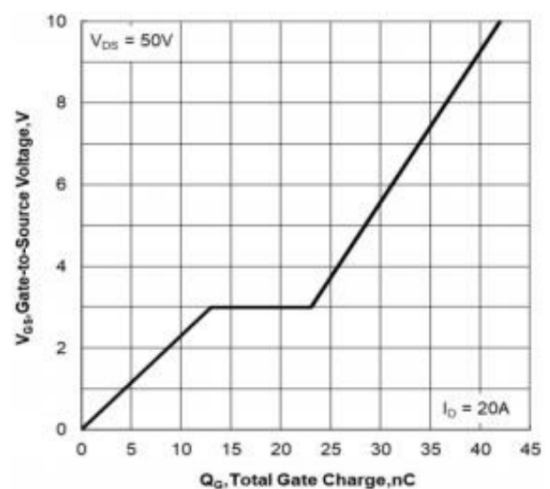


Figure 6. Gate Charge Characteristics



Ratings and Characteristic Curves

Figure 7. Normalized Breakdown Voltage vs Junction Temperature

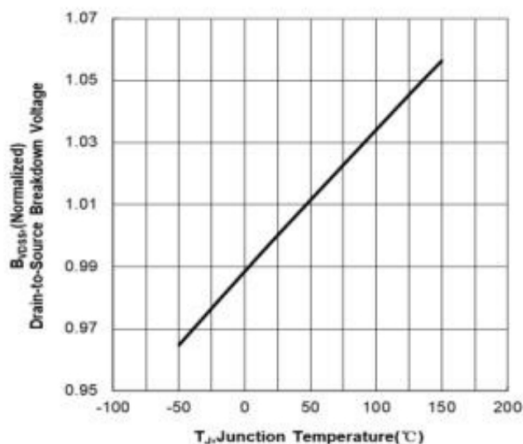


Figure 8. Normalized On Resistance vs Junction Temperature

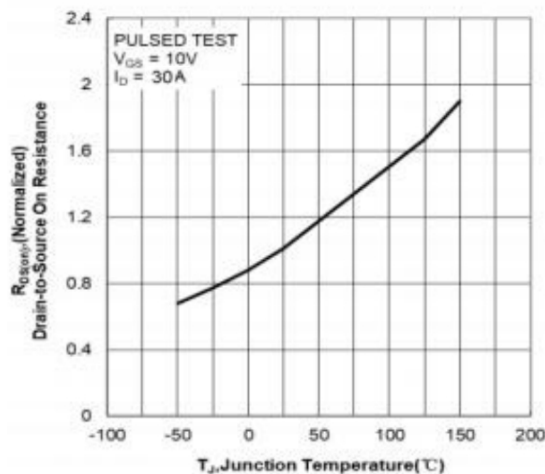


Figure 9. Maximum Continuous Drain Current vs Case Temperature

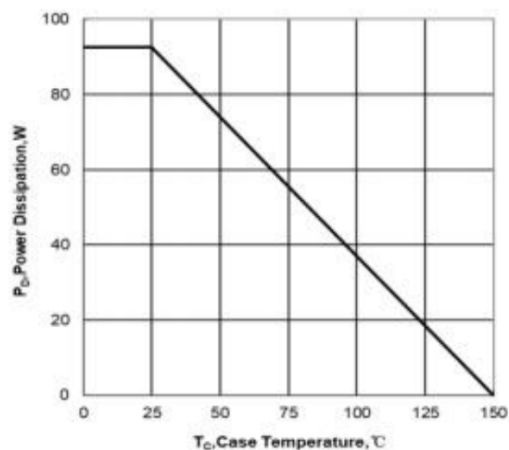


Figure 10. Maximum Power Dissipation vs Case Temperature

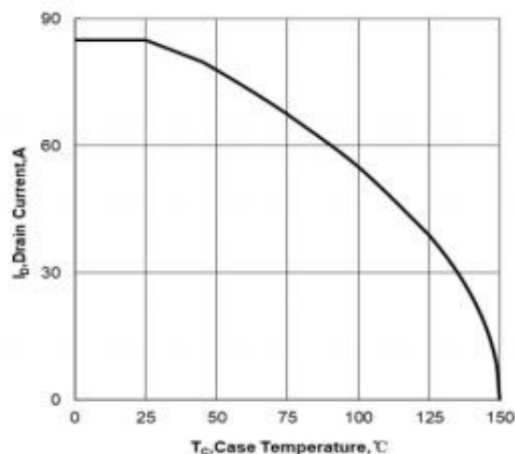


Figure 11. Drain-to-Source On Resistance vs Gate Voltage and Drain Current

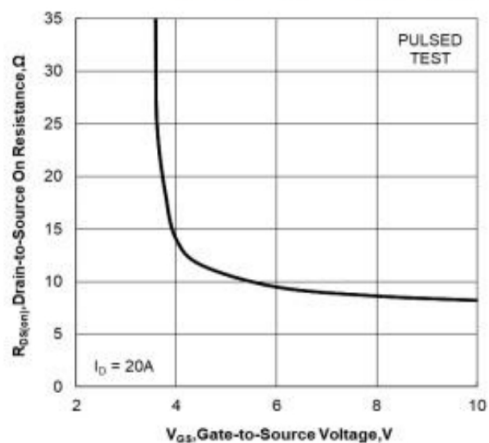
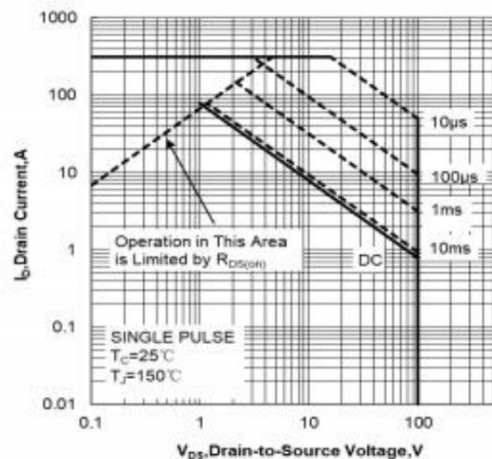
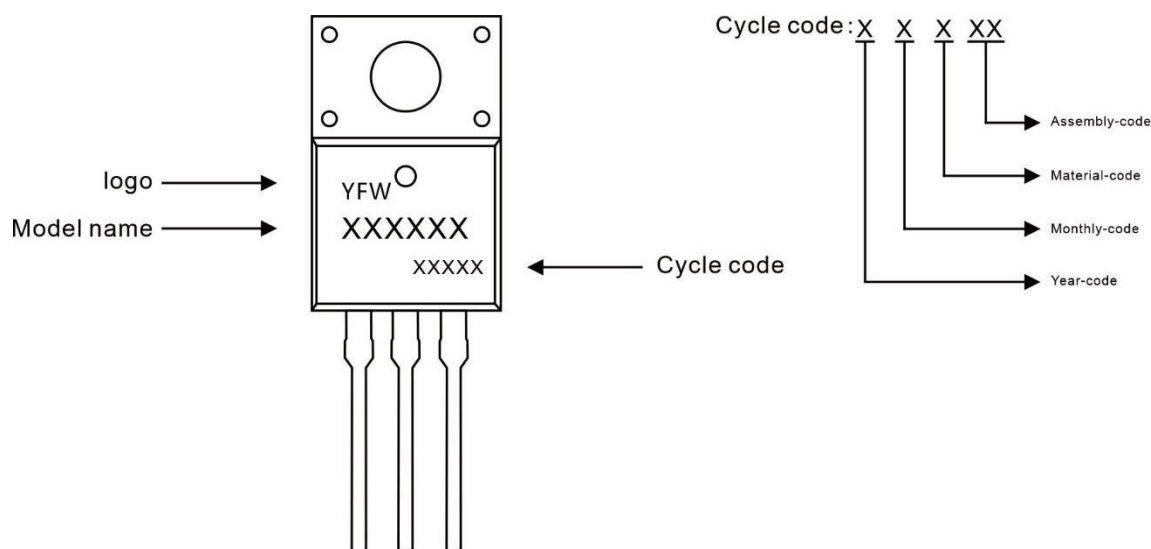


Figure 12. Maximum Safe Operating Area



Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWG80N12AF	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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