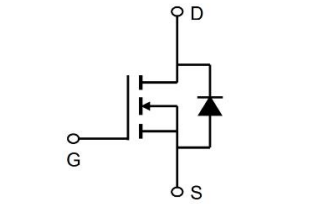
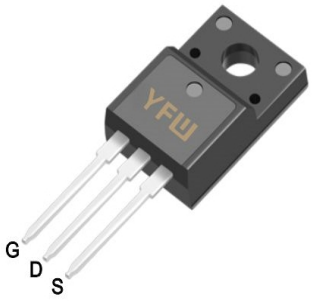
120V N-CHANNEL ENHANCEMENT MODE POWER MOSFET

MAIN CHARACTERISTICS

I_D	40A
V_{DS}	120V
R_{DSON}-typ(@V_{GS}=10V)	＜13mΩ(Typ:10mΩ)





TO-220F

FEATURES

- Proprietary New Trench Technology
- Low Gate Charge Minimize Switching Loss
- Fast Recovery Body Diode
- **YFW-SGT technology**

APPLICATION

- DC-DC Converters
- Ideal for high-frequency switching and synchronous

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	40	A
Pulsed Drain Current (Note1)	I_{DM}	160	A
Power Dissipation	P_D	50	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	180	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	°C/W
Thermal Resistance, Junction--Ambient	$R_{\theta JA}$	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=250uA	BV_{DSS}	120	-	-	V
Drain-Source Leakage Current	V_{DS}=120V , 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	$V_{GS(th)}$	1.1	-	2.5	V
Drain-source on-state resistance	V_{GS}=10V, I_D=20A	$R_{DS(ON)}$	-	10	13	mΩ
	V_{GS}=4.5V, I_D=20A		-	14	16.5	
Input Capacitance	V_{GS}=0V V_{DS}=60V f=1MHz	C_{iss}	-	1431	-	pF
Output Capacitance		C_{oss}	-	313	-	
Reverse Transfer Capacitance		C_{rss}	-	31	-	
Turn-on delay time(Note2)	V_{DD}=60V V_{GS}=10V R_G=2.2Ω I_D=20 A	$t_{d(on)}$	-	14	-	ns
Rise Time(Note2)		T_r	-	5	-	
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	30	-	
Fall Time(Note2)		t_f	-	6	-	
Total Gate Charge(Note2)	I_D=20A V_{DS}=60V V_{GS}=10V	Q_g	-	21	-	nC
Gate-Source Charge(Note2)		Q_{gs}	-	5	-	
Gate-Drain Charge(Note2)		Q_{gd}	-	3	-	
Maximun Body-Diode Continuous Current		I_S	-	-	40	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	160	A
Drain-Source Diode Forward Voltage	I_S=30A, V_{GS}=0 V TJ=25℃	V_{SD}	-	-	1.2	V
Reverse Recovery Time(Note2)	I_{SD} = 20 A, V_{GS} = 0 V, dIF / dt = 100 A/μs	t_{rr}	-	57	-	ns
Reverse Recovery Charge(Note2)		Q_{rr}	-	59	-	nC

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

Ratings and Characteristic Curves

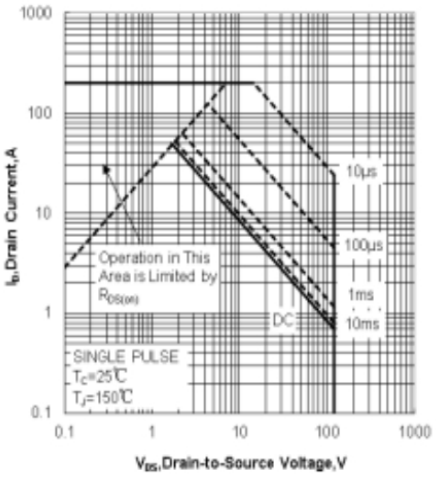


Figure1. Maximum Forward Bias Safe Operating Area

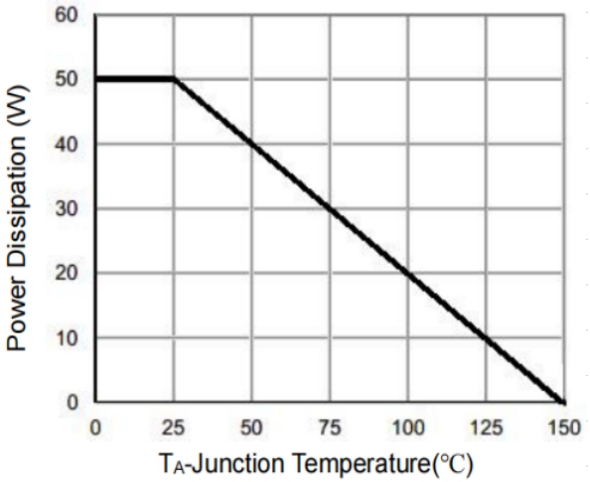


Figure2. Maximum Power Dissipation vs Case Temperature

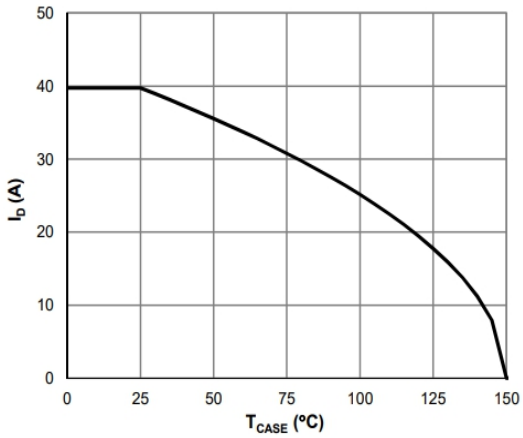


Figure3. Maximum Continuous Drain Current vs Case Temperature

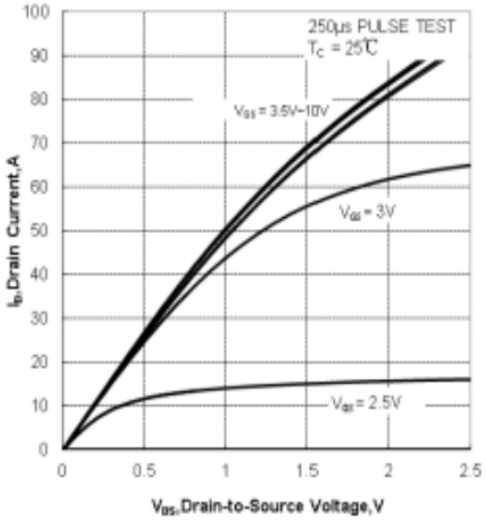


Figure 4. Typical Output Characteristics

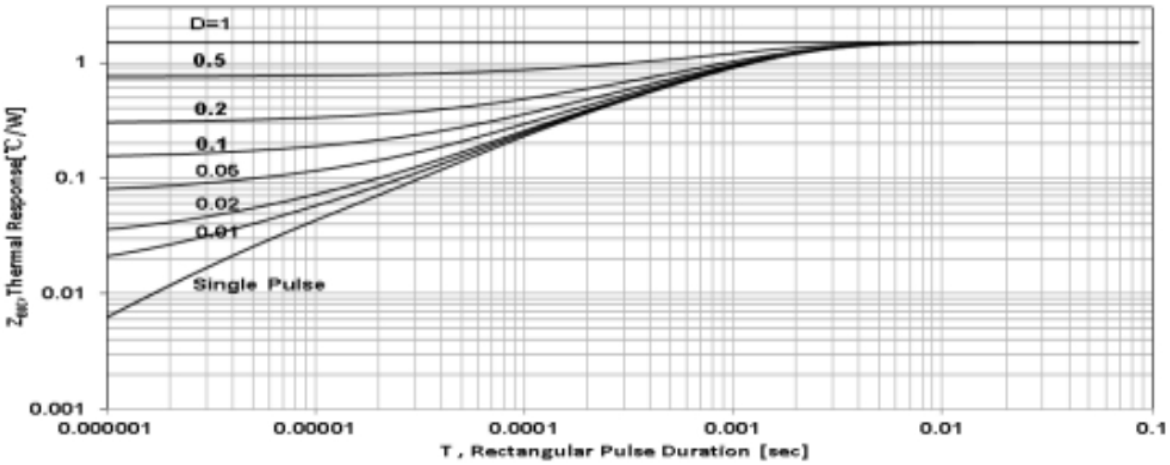


Figure5. Maximum Effective Transient Thermal Impedance, Junction-to-Case

Ratings and Characteristic Curves

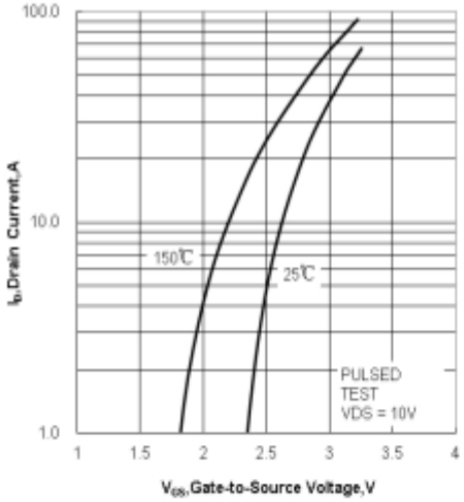


Figure 6. Typical Transfer Characteristics

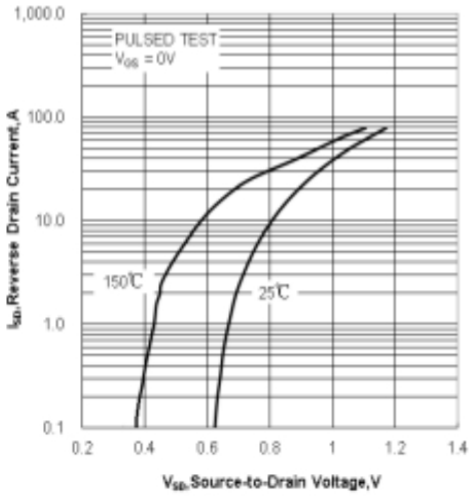


Figure 7. Typical Body Diode Transfer Characteristics

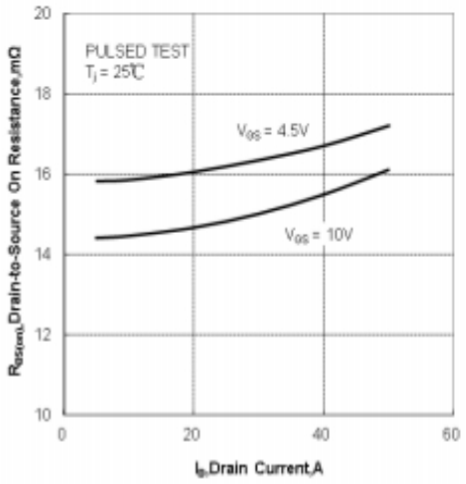


Figure 8. Drain-to-Source On Resistance vs Drain Current

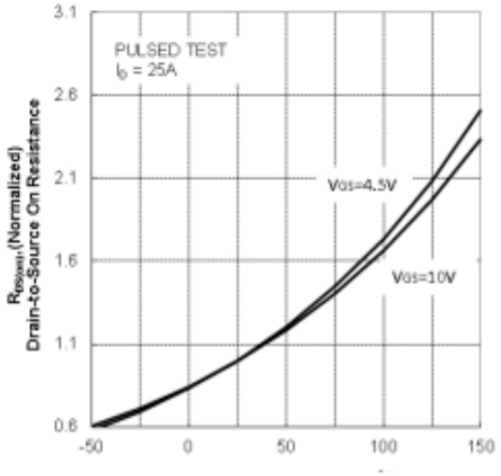


Figure 9. Nomalized on Resistance vs Junction Temperature

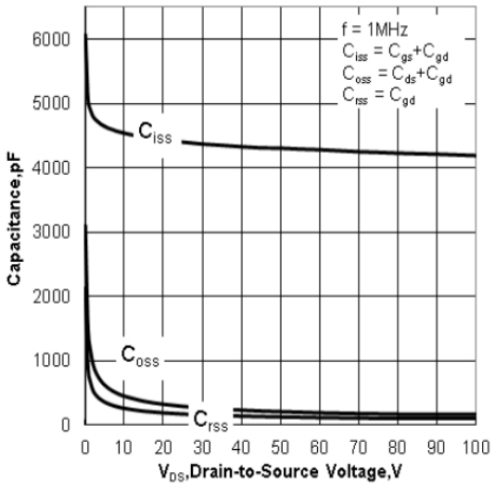


Figure 10. Capacitance Characteristics

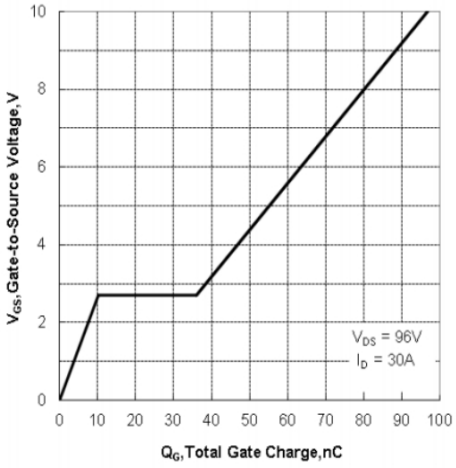
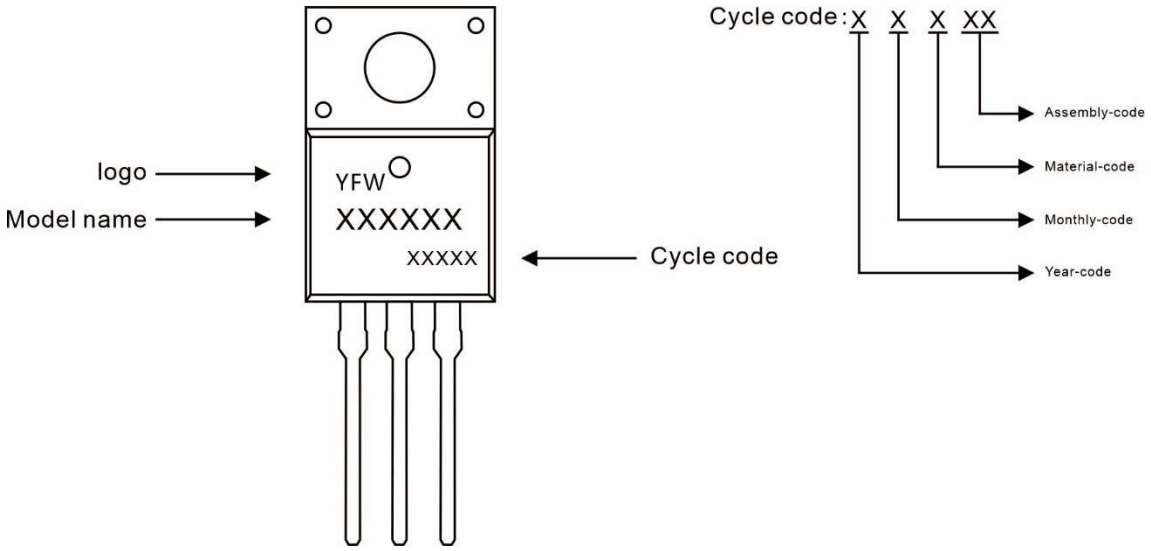


Figure 11. Typical Gate Charge vs Gate to Source Voltage

Marking Diagram

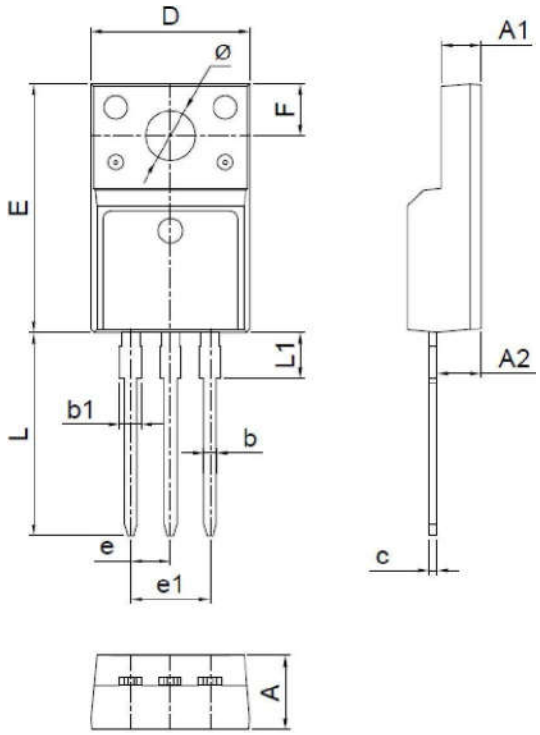


Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWG40N12AF	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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