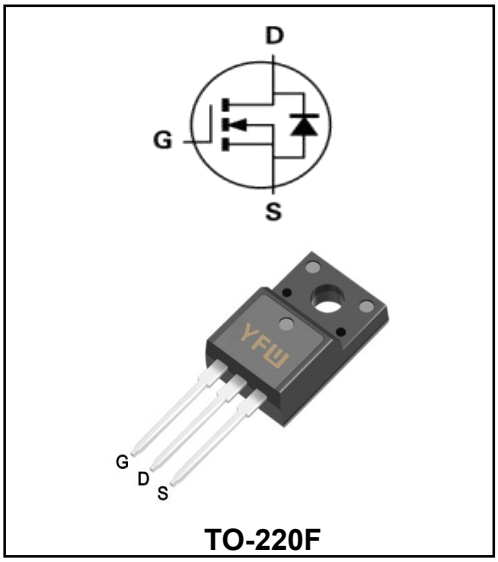
650V N-CHANNEL SUPER JUNCTION MOSFET

MAIN CHARACTERISTICS

I_D	30A
V_{DSS}	650V
R_{DSON}-typ(@V_{GS}=10V)	＜110mΩ(Type:99mΩ)



TO-220F

Features

- Extremely low switching loss
- Excellent stability and uniformity
- Fast Recovery Time

APPLICATIONS

- Switch Mode Power Supply(SMPS)
- Uninterruptible Power Supply(UPS）
- Power Factor Correction(PFC)

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℃ maximum,10s per JESD 22-B106

Electrical Characteristics at Tc=25°C uni ess otherwise spec fied

Characteristics	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	±30	V
Continue Drain Current	I_D	30	A
Pulsed Drain Current (Note1)	I_{DM}	90	A
Power Dissipation	P_D	200	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	540	mJ
Operating Temperature Range	T_J	-50 to +150	°C
Storage Temperature Range	T_{STG}	-50 to +150	°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.61	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	°C/W

Note1:Pulse test: 300 |js pulse width, 2 % duty cycle

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS} = 0 V,I_D = 250μA	BV_{DSS}	650	-	-	V
Drain-Source Leakage Current	V_{DS} =650 V, V_{GS} = 0 V	I_{DSS}	-	-	1	μA
Gate Leakage Current	V_{GS} = ± 30 V, V_{DS} = 0 V	I_{GSS}	-	-	±100	nA
Gate-Source Threshold Voltage	V_{DS} = V_{GS} , I_D = 250μA	$V_{GS(th)}$	3	-	4.5	V
Drain-Source On-State Resistance	VGS=10V, ID=15A	$R_{DS(on)}$		99	110	mΩ
Input Capacitance	VDS=400V , VGS=0V f=1MHz	C_{iss}		3200		pF
Output Capacitance		C_{oss}		70		pF
Reverse Transfer Capacitance		C_{rss}		3.6		pF
Turn-on Delay Time(Note2)	VDD = 325V, ID =16.7 A, RG =25Ω	$t_{d(on)}$		63		ns
Rise Time(Note2)		T_r		31		ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$		282		ns
Fall Time(Note2)		t_f		20		ns
Total Gate Charge(Note2)	VDS = 520V VGS = 10V ID = 16.7 A	Q_g		75		nC
Gate to Source Charge(Note2)		Q_{gs}		14		nC
Gate to Drain Charge(Note2)		Q_{gd}		22		nC
Maximun Body-Diode Continuous Current		I_S	-	-	30	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	90	A
Drain-Source Diode Forward Voltage	VGS=0V , IS=1A , TJ=25°C	V_{SD}	-	-	1.2	V
Body Diode Reverse Recovery Time	VR=400V,IF=15A, dI/dt=100A/μs	T_{rr}	-	151	-	ns
Body Diode Reverse Recovery Charge		Q_{rr}	-	920	-	nC

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

Ratings and Characteristic Curves

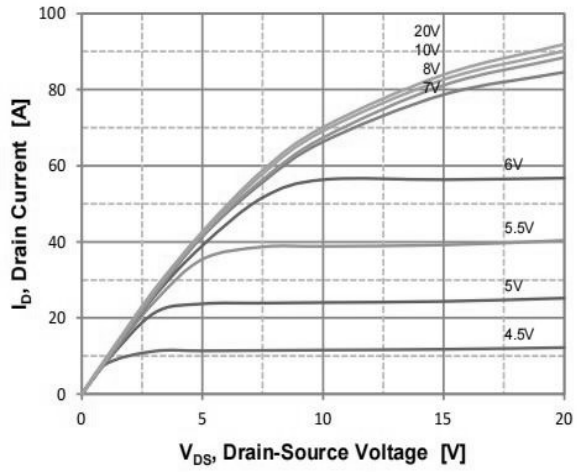


Figure 1. On Region Characteristics

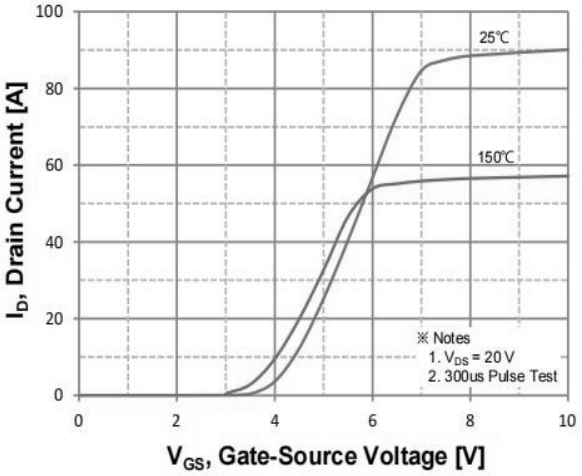


Figure 2. Transfer Characteristics

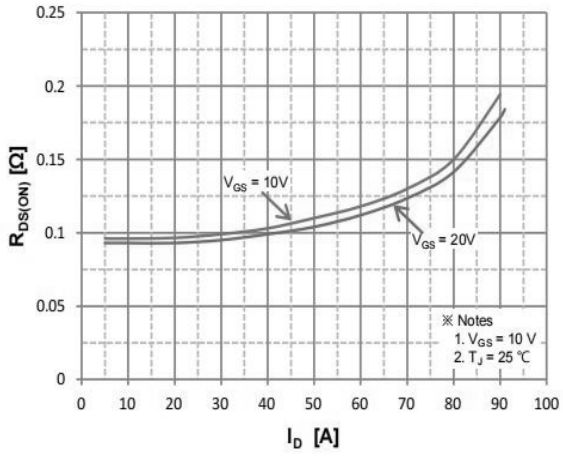


Figure 3. On Resistance Variation vs Drain Current and Gate Voltage

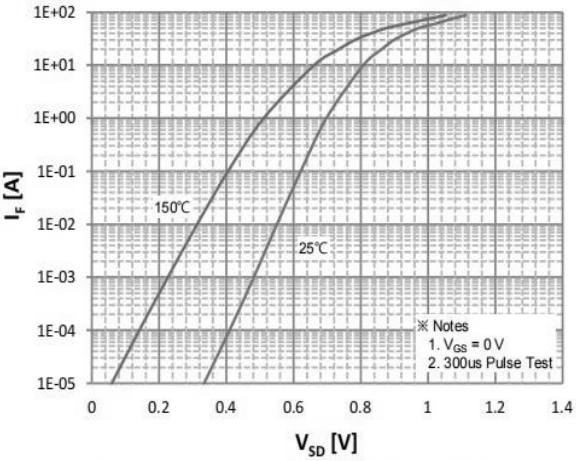


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

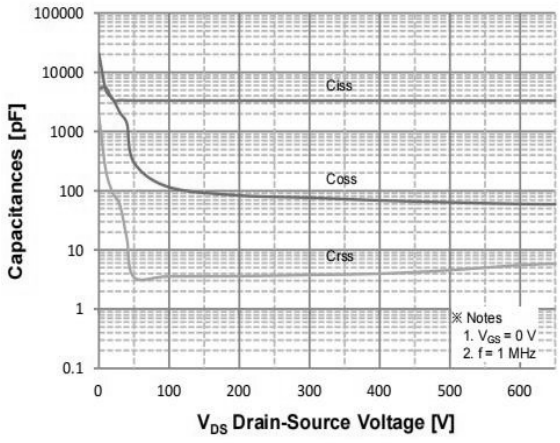


Figure 5. Capacitance Characteristics

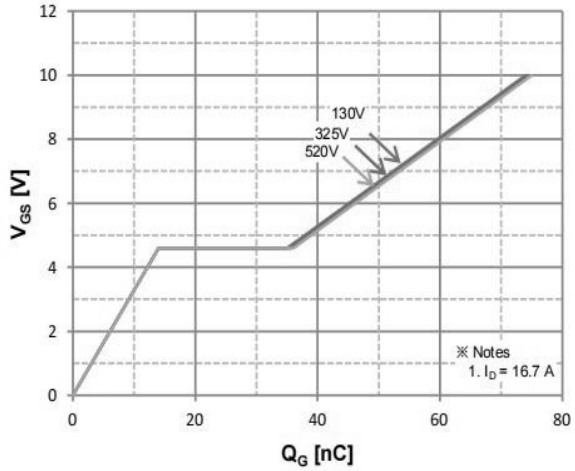


Figure 6. Gate Charge Characteristics

Ratings and Characteristic Curves

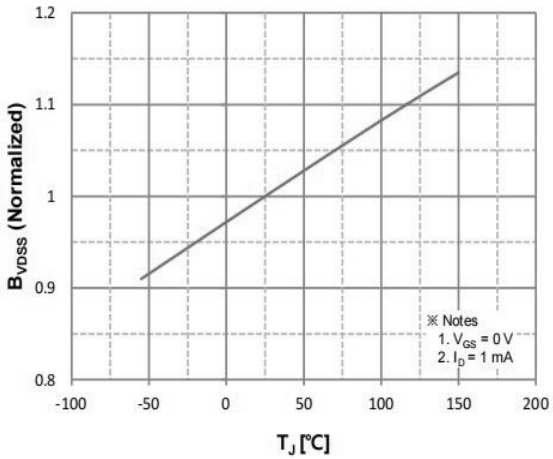


Figure 7. Breakdown Voltage Variation vs. Temperature

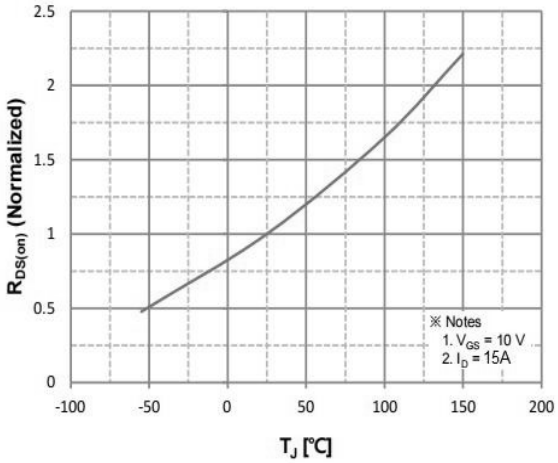


Figure 8. On-Resistance Variation vs. Temperature

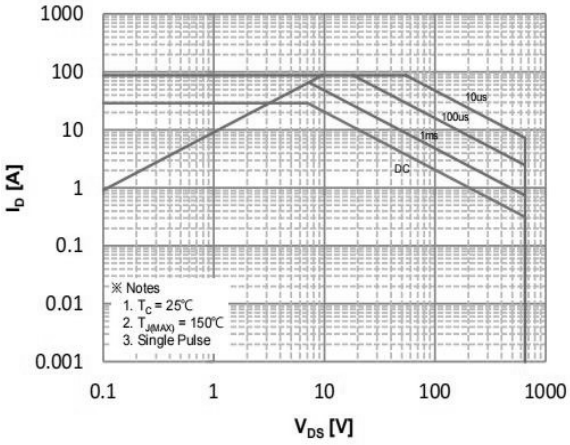


Figure 9. Maximum Safe Operating Area

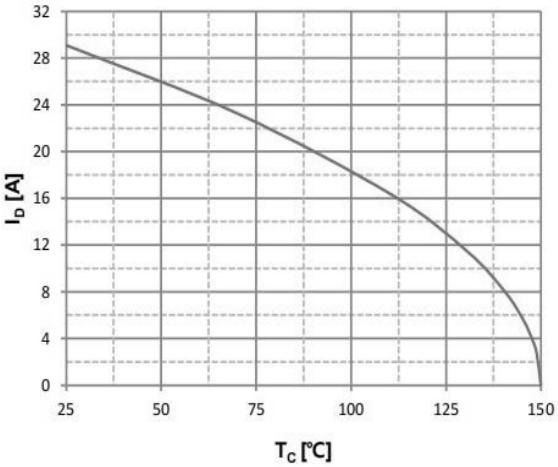


Figure 10. Maximum Drain Current vs. Case Temperature

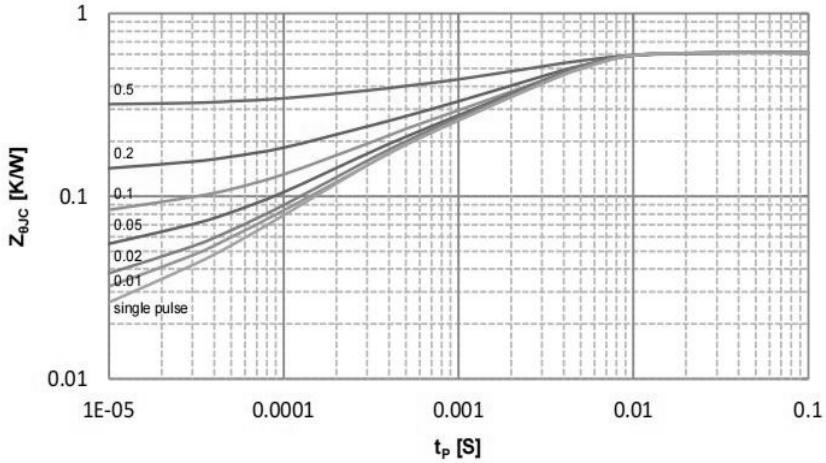
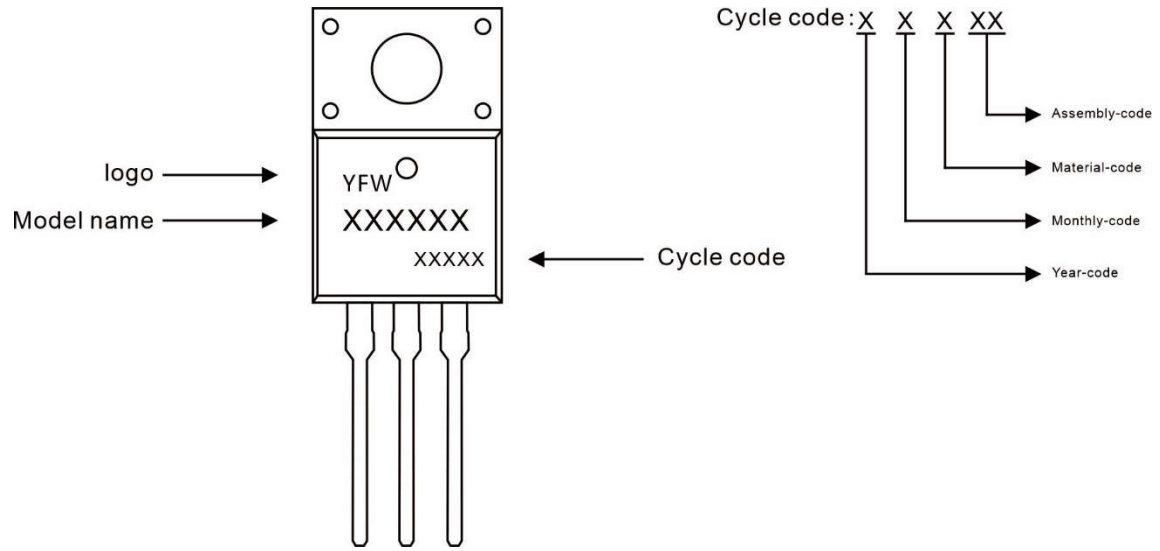


Figure 11. Transient Thermal Response Curve

Marking Diagram

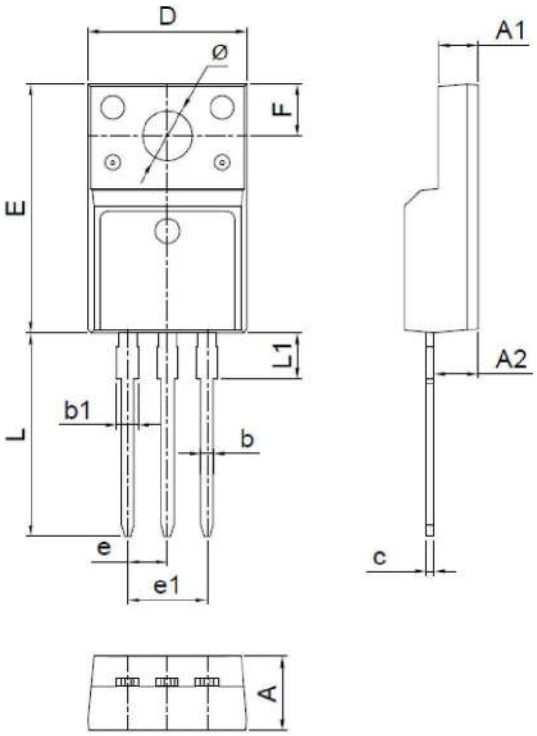


Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW65R099AF	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

Disclaimer

The information presented in this document is for reference only. GuangDong Youfeng Microelectronics Co.,Ltd. reserves the right to make changes without notice for the specification of the products displayed herein to improve reliability, function or design or otherwise. The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of with would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices),YFW or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale. This publication supersedes & replaces all information previously supplied. For additional information, please visit our website https://www.yfwdiode.com, or consult YFW sales office for further assistance.