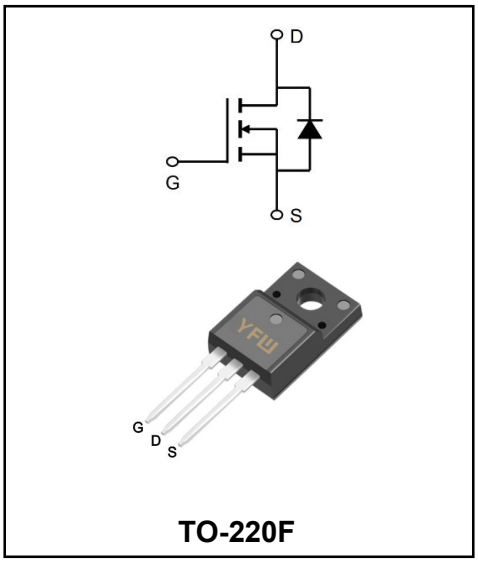
650V N-channel Super Junction MOSFET

MAIN CHARACTERISTICS

I_D	30A
V_{DSS}	650V
R_{DSON}-typ(@V_{GS}=10V)	＜130mΩ(Typ:120mΩ)



TO-220F

FEATURES

- Low gate charge
- Low RDS(on) per chip area(Low FOM)
- Very low switching and conduction loss
- Extremely high commutation ruggedness

APPLICATIONS

- Solar inverters
- LCD/LED/PDP TV
- Telecom/Server Power supplies
- AC-DC Power Supply

MECHANICAL DATA

- Case: TO-220F/AF
- 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

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
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	34	W
Single Pulse Avalanche Energy	E_{AS}	330	mJ
Operating Temperature Range	T_J	-55 to +150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Thermal Resistance, Junction-case	$R_{\theta JC}$	3.7	°C/W
Thermal Resistance, Junction-ambient	$R_{\theta JA}$	80	°C/W

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

Electrical Characteristics at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{GS}=0V, 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	$V_{GS(th)}$	2	-	4	V
Drain-source on-state resistance	V_{GS}=10V, I_D=15A	$R_{DS(ON)}$	-	120	130	mΩ
Input Capacitance	V_{GS}=0V V_{DS}=50V f=1.0MHz	C_{iss}	-	1950	-	pF
Output Capacitance		C_{oss}	-	245	-	
Reverse Transfer Capacitance		C_{rss}	-	29	-	
Turn-on Delay Time(Note2)	V_{DS} =300V I_D = 30 A R_G =25Ω	$t_{d(on)}$	-	30	-	ns
Rise Time(Note2)		T_r	-	45	-	
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	145	-	
Fall Time(Note2)		t_f	-	36	-	
Total Gate Charge(Note2)	V_{DS} = 480V V_{GS} = 10V I_D = 30A	Q_g	-	50	-	nC
Gate to Source Charge(Note2)		Q_{gs}	-	10	-	
Gate to Source Charge(Note2)		Q_{gd}	-	14	-	
Maximun Body-Diode Continuous Current		I_S	-	-	30	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	90	A
Drain-Source Diode Forward Voltage	V_{GS}=0V , I_S=30A , T_J=25℃	V_{SD}	-	-	1.4	V
Reverse Recovery Time	V_R=100V I_S=30A,di/dt=100A/μs	t_{rr}	-	370	-	ns
Reverse Recovery Charge		Q_{rr}	-	6.4	-	μC

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

Ratings and Characteristic Curves

Figure1. Output Characteristics

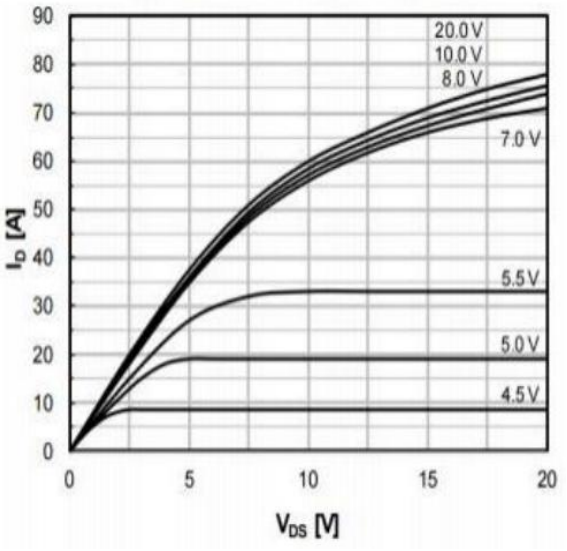


Figure2. Transfer Characteristics

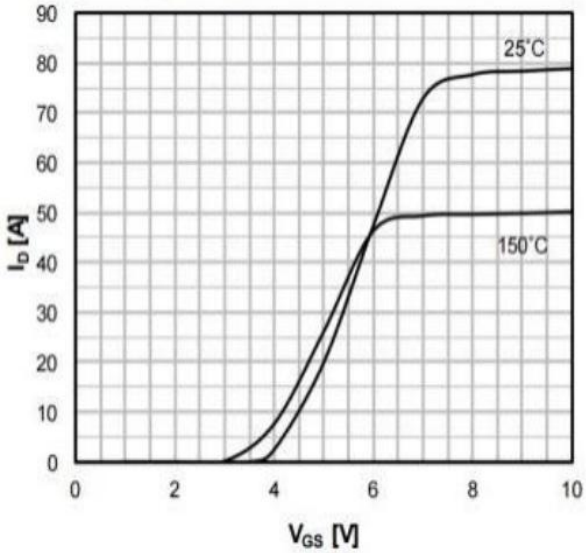


Figure 3. On-Resistance VS.Drain Current

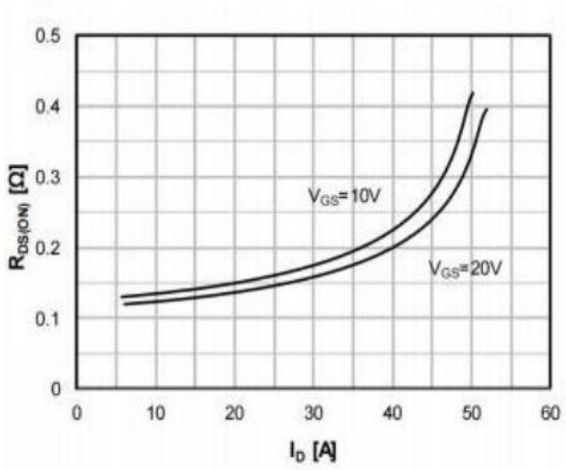


Figure 4. Capacitance

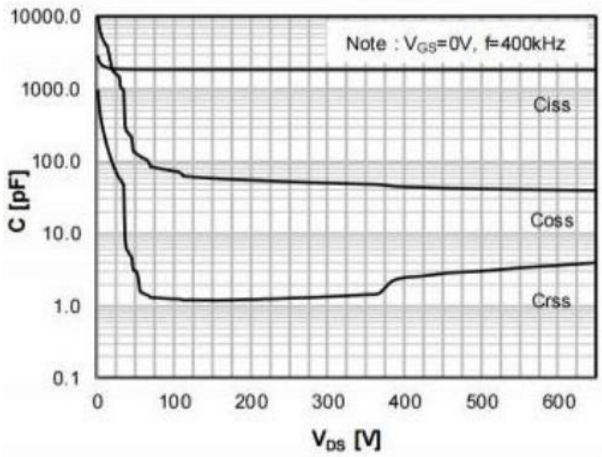


Figure 5. Gate Charge

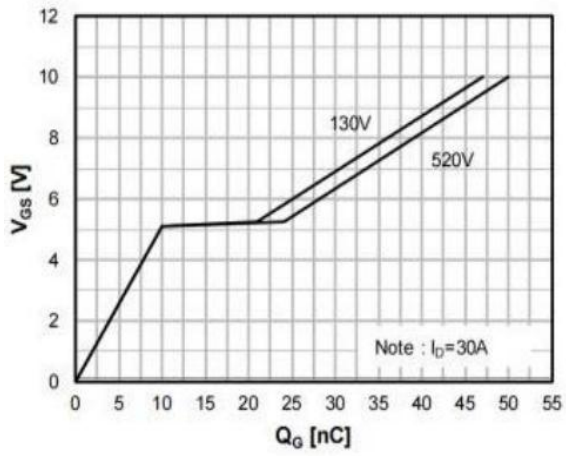
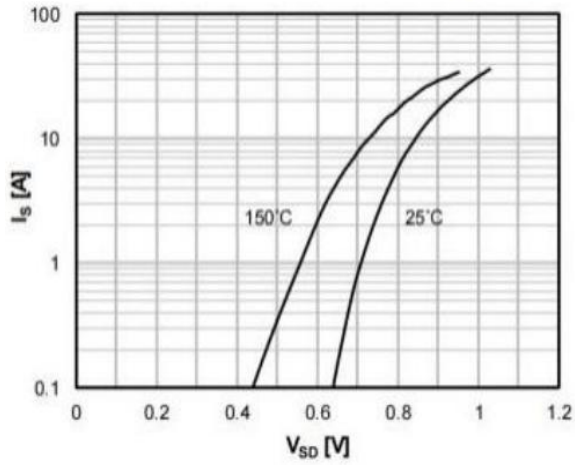


Figure 6.Body Diode Forward Voltage



Ratings and Characteristic Curves

Figure 7.On-Resistan ce vs. Junction Temperature

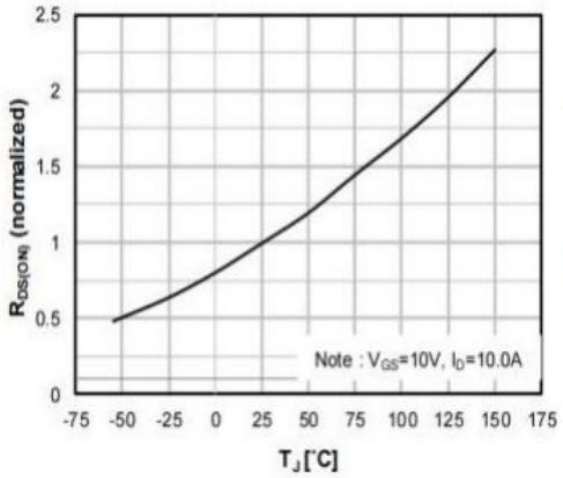


Figure 8.Bearkdown Voltage vs. Junction Temperature

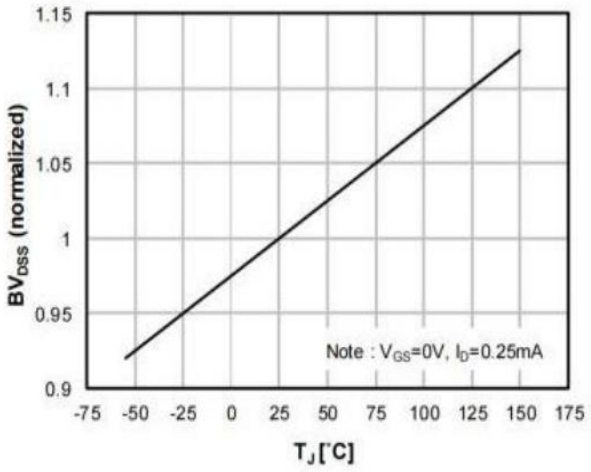


Figure 9.Safe operation area

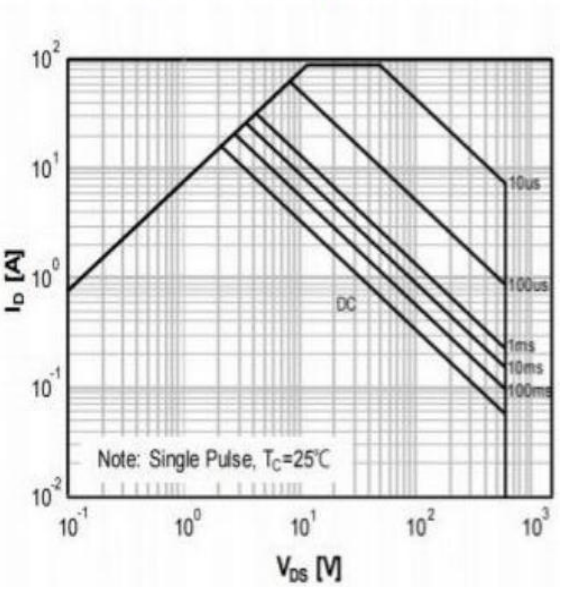
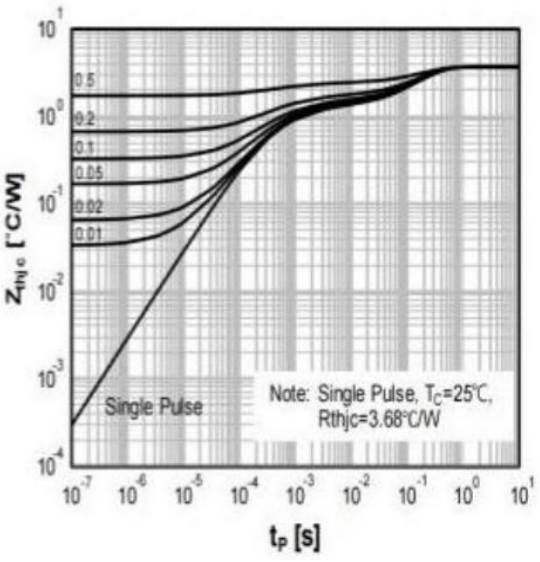
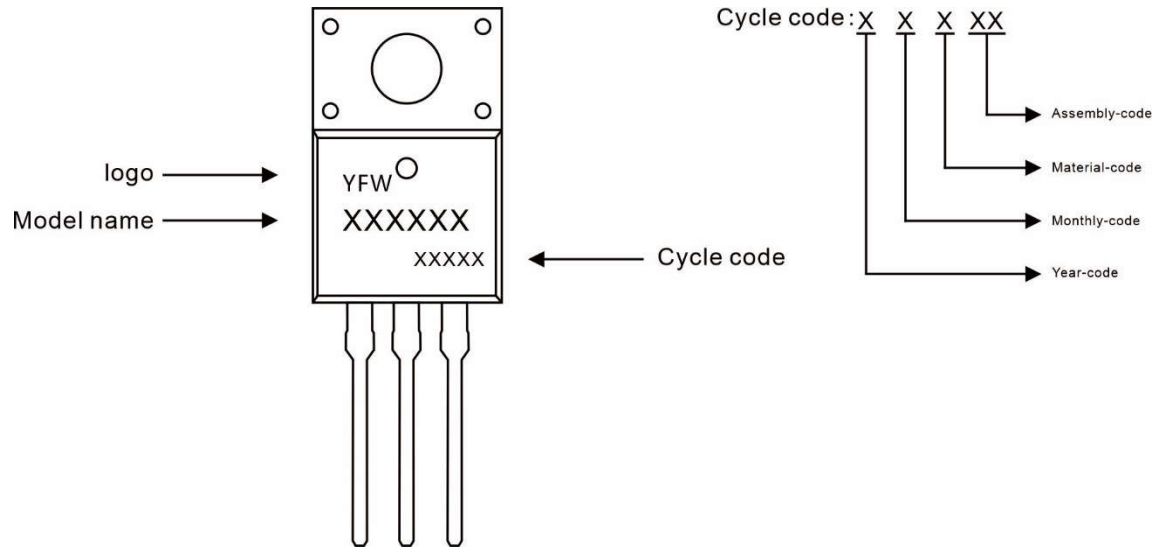


Figure 10.Transient Thermal Impedance



Marking Diagram

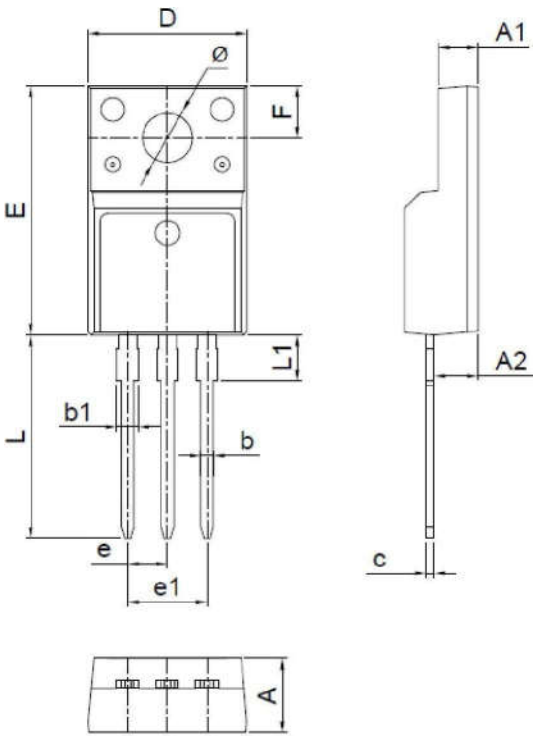


Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW65R120AF	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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