

650V N-CHANNEL SUPER JUNCTION MOSFET

MAIN CHARACTERISTICS

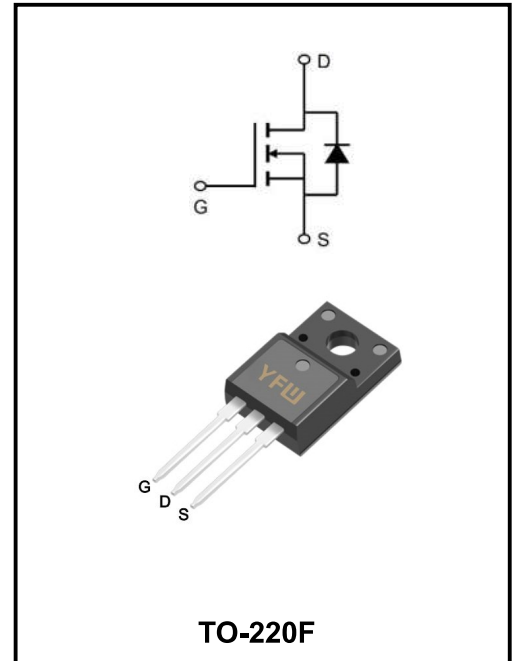
I_D	35A
V_{DS}	650V
R_{DS(on)-typ}(@V_{GS}=10V)	<99mΩ(Typ:85mΩ)

FEATURES

- ◆Low gate charge
- ◆Low C_i
- ◆Fast switchin
- ◆100% avalanche tested

APPLICATIONS

- ◆LED/LCD/PDP TV and monitor Lighting System
- ◆Solar/Renewable/UPS-Micro Inverter System
- ◆Charger
- ◆Power Supply



Electrical Characteristics at T_c=25°C unless otherwise specified

Characteristics	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	±30	V
Continue Drain Current	I_D	35	A
Pulsed Drain Current (Note1)	I_{DM}	150	A
Power Dissipation	P_D	147	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	992	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_{θJC}	0.85	°C/W
Thermal Resistance, Junction to Ambient	R_{θJA}	78	°C/W

Note1:Pulse test: 300 μs 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	$V_{GS} = 0\text{ V}, I_D = 250\mu\text{A}$	BV_{DSS}	650	-	-	V
Drain-Source Leakage Current	$V_{DS} = 650\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	-	-	1	μA
Gate Leakage Current	$V_{GS} = \pm 30\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	$V_{GS(th)}$	3.0	-	4.5	V
Drain-Source On-State Resistance	$V_{GS} = 10\text{V}, I_D = 17\text{A}$	$R_{DS(on)}$	-	85	99	m Ω
Input Capacitance	$V_{DS} = 100\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$	C_{iss}	-	1880	-	pF
Output Capacitance		C_{oss}	-	115	-	pF
Reverse Transfer Capacitance		C_{rss}	-	2	-	pF
Turn-on Delay Time(Note2)	$V_{DD} = 400\text{V}, I_D = 17\text{A}, R_G = 27\Omega$	$t_{d(on)}$	-	50	-	ns
Rise Time(Note2)		T_r	-	80	-	ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	179	-	ns
Fall Time(Note2)		t_f	-	50	-	ns
Total Gate Charge(Note2)	$V_{DS} = 480\text{V}, V_{GS} = 10\text{V}, I_D = 17\text{A}$	Q_g	-	69	-	nC
Gate to Source Charge(Note2)		Q_{gs}	-	17	-	nC
Gate to Drain Charge(Note2)		Q_{gd}	-	45	-	nC
Maximun Body-Diode Continuous Current		I_S	-	-	35	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	105	A
Drain-Source Diode Forward Voltage	$V_{GS} = 0\text{V}, I_S = 17\text{A}, T_J = 25^\circ\text{C}$	V_{SD}	-	-	1.5	V
Body Diode Reverse Recovery Time	$V_R = 400\text{V}, I_F = 17\text{A}, di/dt = 100\text{A}/\mu\text{s}$	T_{rr}	-	140	-	ns
Body Diode Reverse Recovery Charge		Q_{rr}	-	0.9	-	nC

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

Ratings and Characteristic Curves

Fig 1. Output Characteristics ($T_J=25^{\circ}\text{C}$)

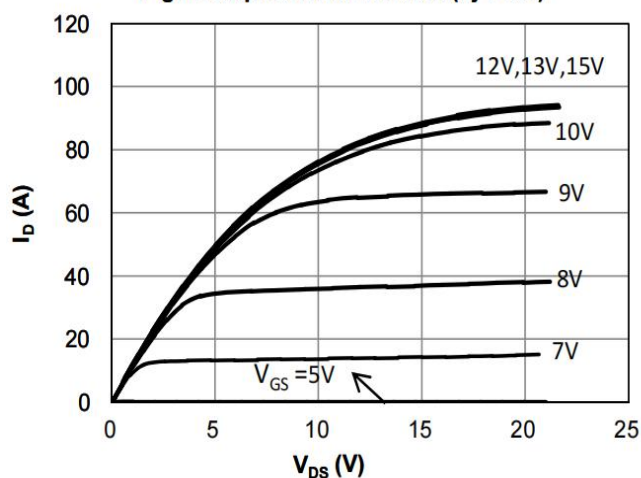


Fig 2. Output Characteristics ($T_J=150^{\circ}\text{C}$)

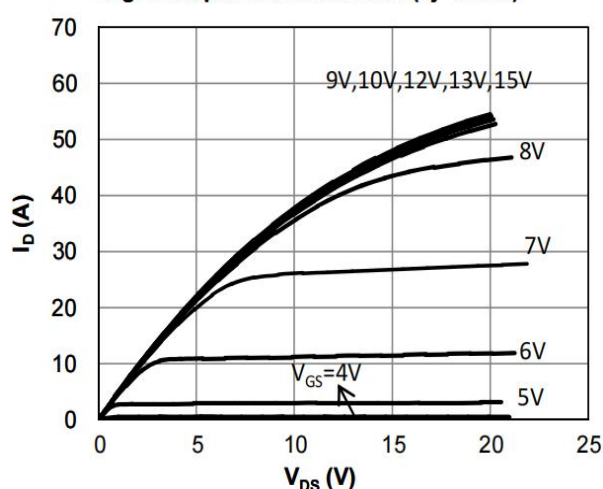


Fig 3: Transfer Characteristics

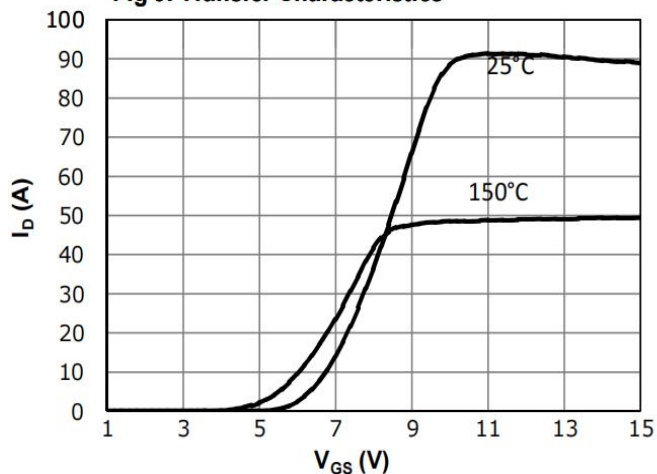


Fig 4: V_{TH} Vs T_J Temperature Characteristics

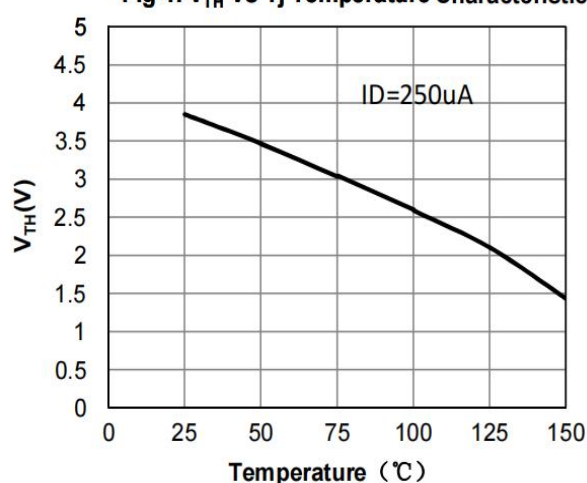


Fig 5: $R_{DS(on)}$ Vs I_{DS} Characteristics ($T_J=25^{\circ}\text{C}$)

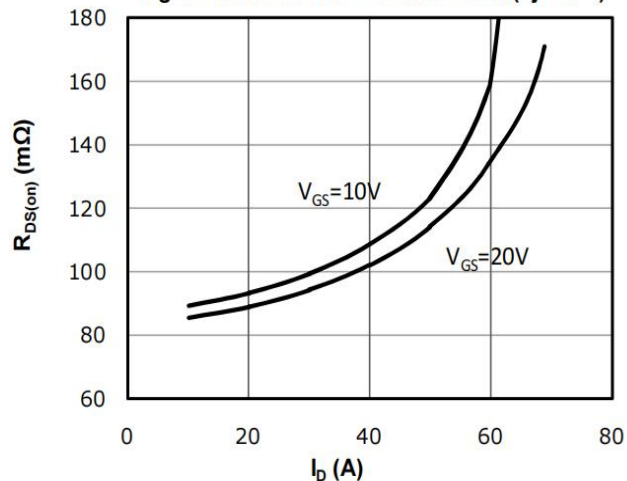
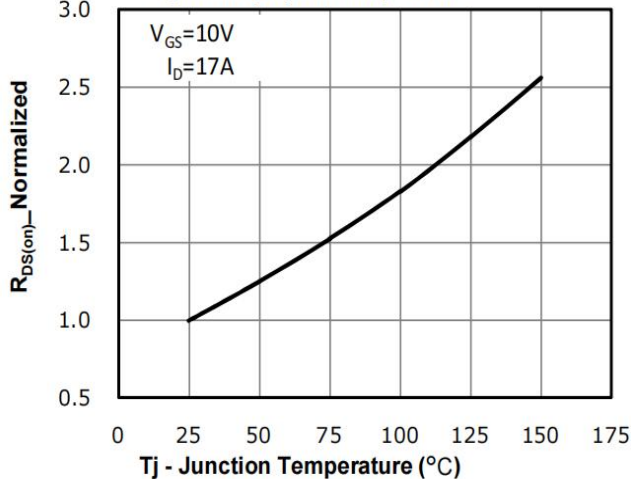


Fig 6: $R_{DS(on)}$ vs. Temperature



Ratings and Characteristic Curves

Fig 7: BVdss vs. Temperature

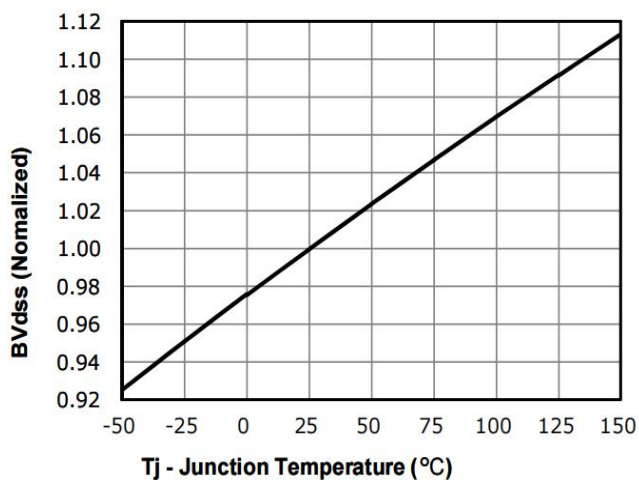


Fig 8: Rds(on) vs Gate Voltage

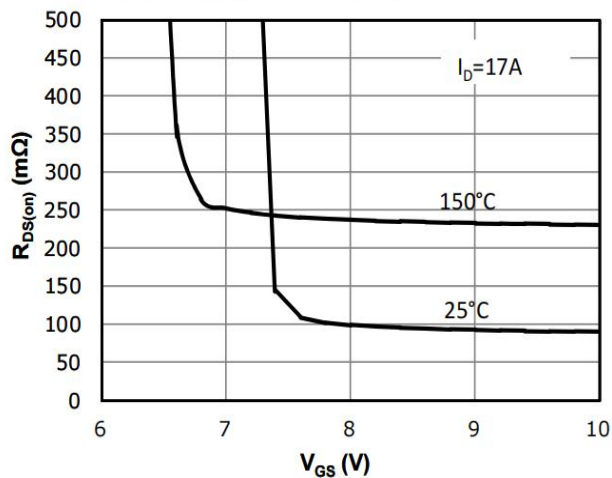


Fig 9: Body-diode Forward Characteristics

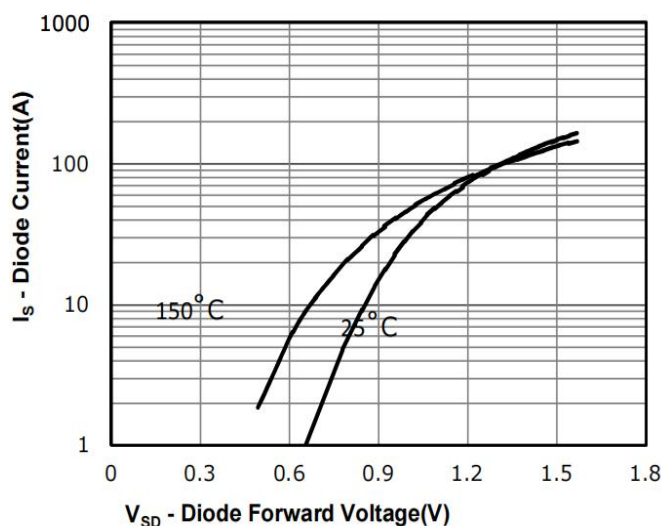


Fig 10: Gate Charge Characteristics

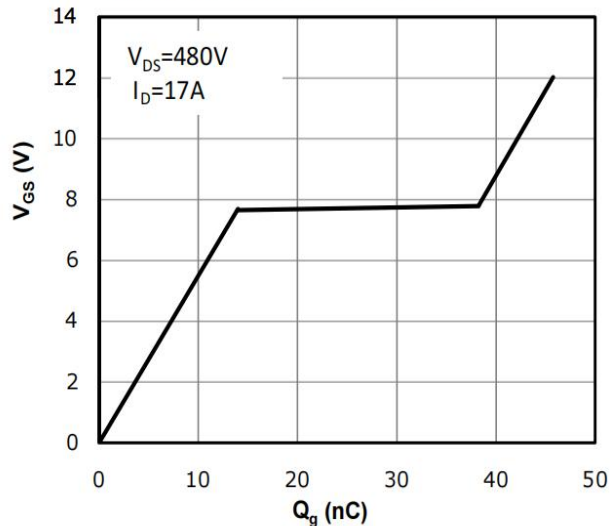


Fig 11: Capacitance Characteristics

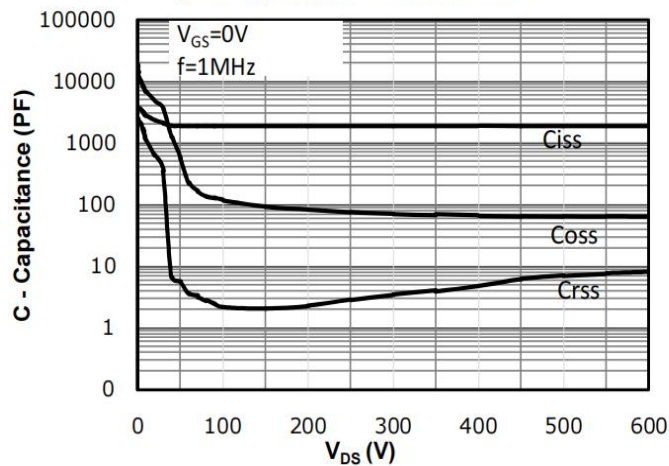
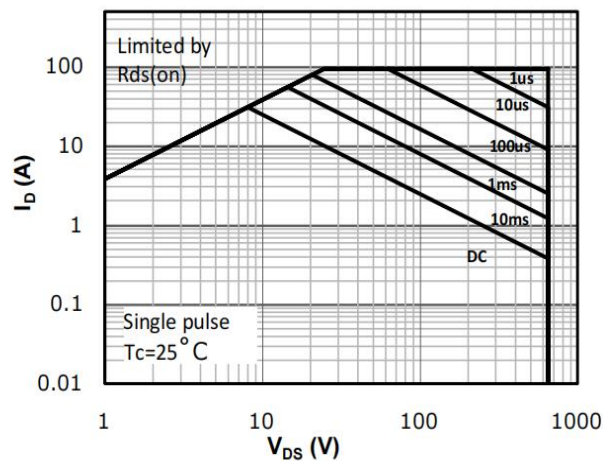
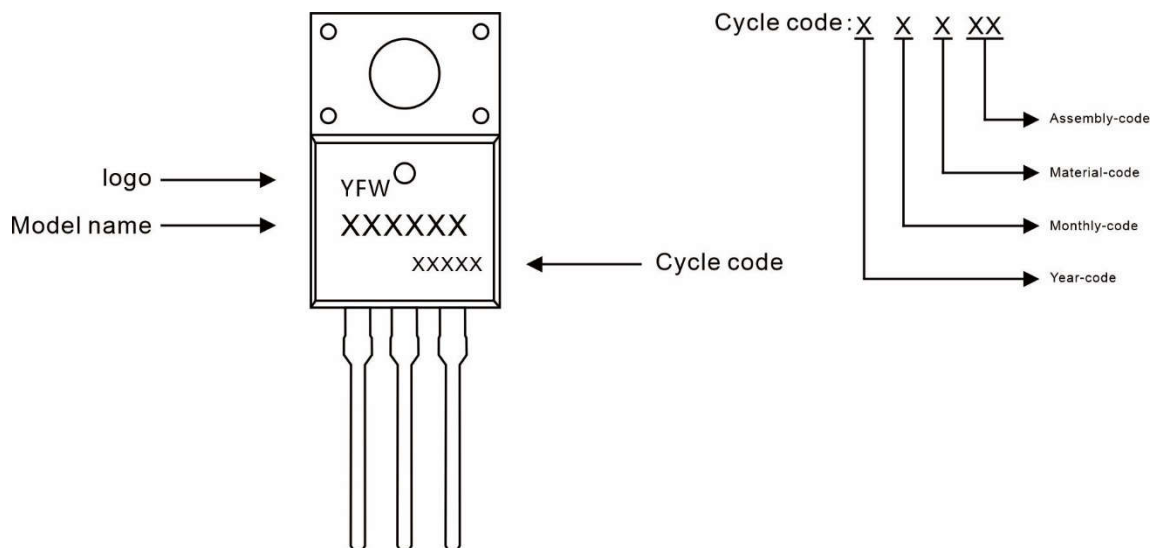


Fig 12: Safe Operating Area



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

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