

650V N-CHANNEL SUPER JUNCTION MOSFET

MAIN CHARACTERISTICS

I_D	15A
V_{DSS}	650V
$R_{DS(on)-typ}(@V_{GS}=10V)$	$<280m\Omega$ (Typ:238mΩ)

Features

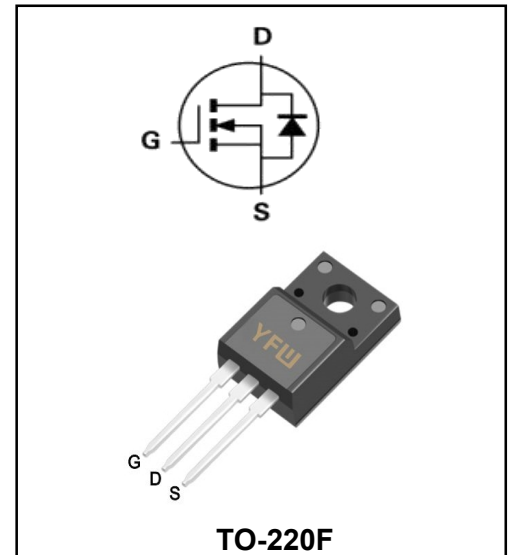
- ♦ Low gate charge
- ♦ Low RDS(on) per chip area(Low FOM)
- ♦ Very low switching and conduction loss
- ♦ Extremely high commutation ruggedness

Application

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

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°C maximum, 10s per JESD 22-B106



Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Symbol	Value	Unit
		220F	
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	±30	V
Continue Drain Current	I_D	15	A
Pulsed Drain Current (Note1)	I_{DM}	45	A
Power Dissipation	P_D	104	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	290	mJ
Operating Temperature Range	T_J	-50 to +150	°C
Storage Temperature Range	T_{STG}	-50 to +150	°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.2	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62	°C/W

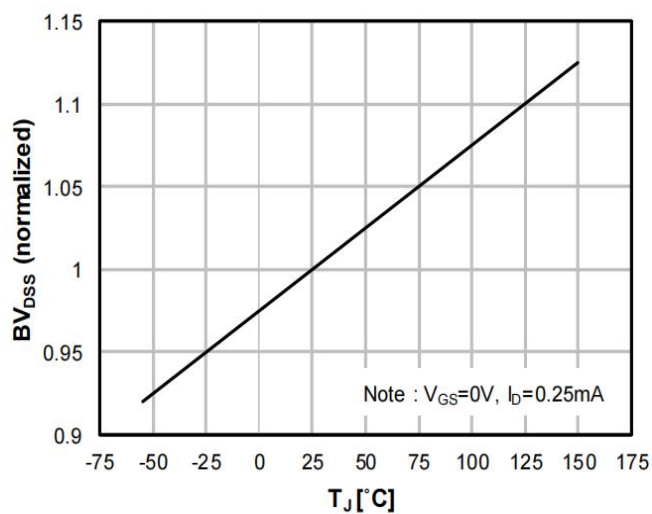
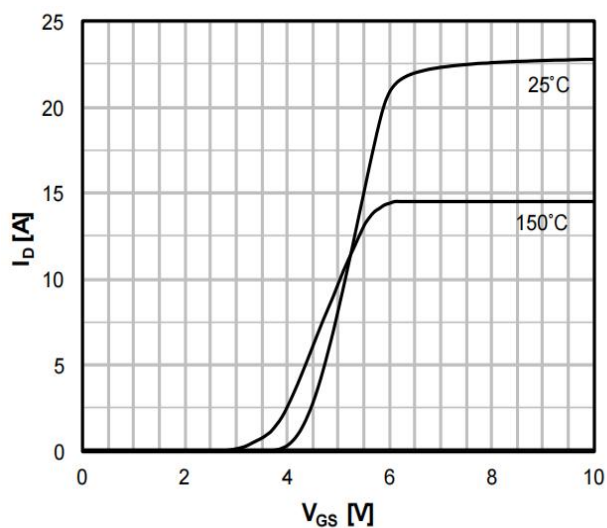
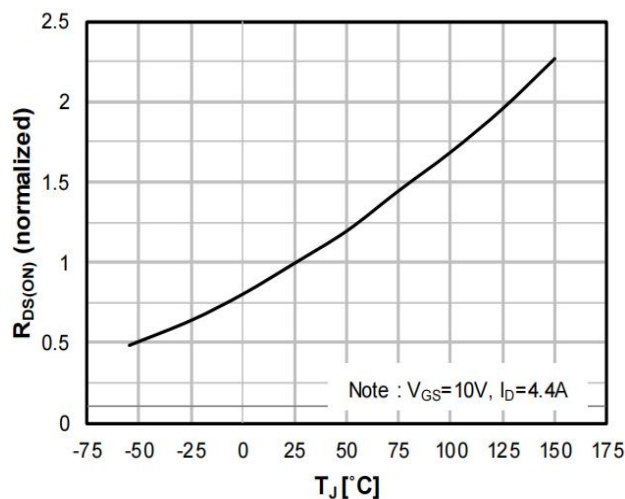
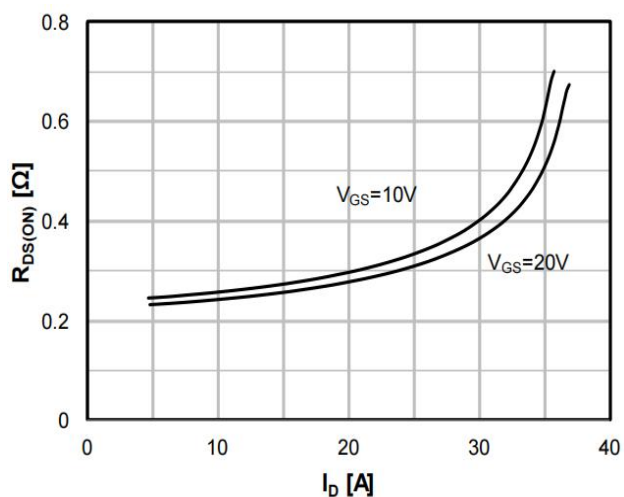
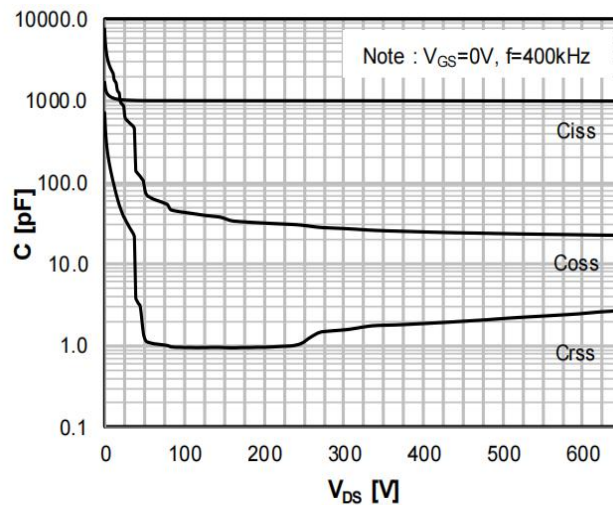
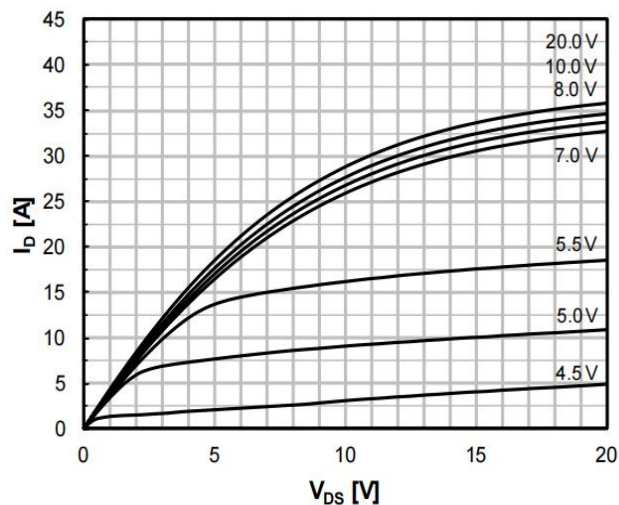
Note1:Pulse test: 300 μs pulse width, 2 % duty cycle

Maximum Ratings at Tc=25°C unless otherwise specified

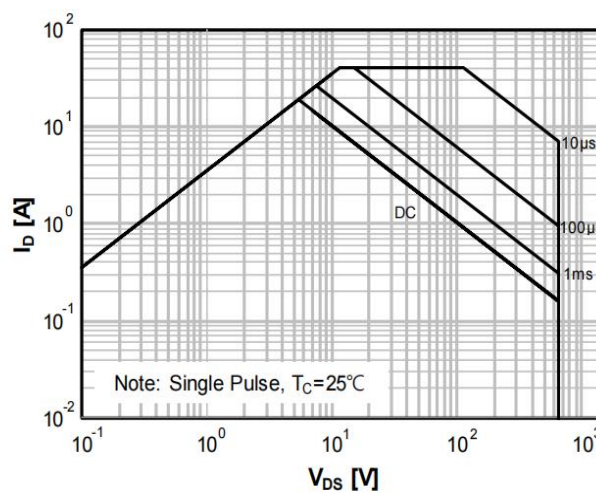
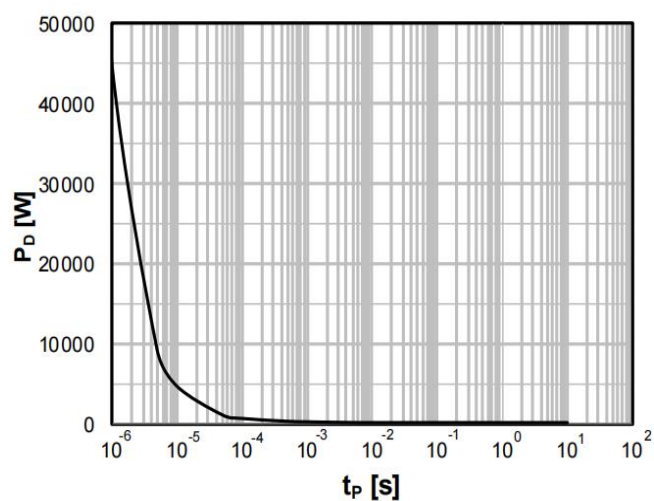
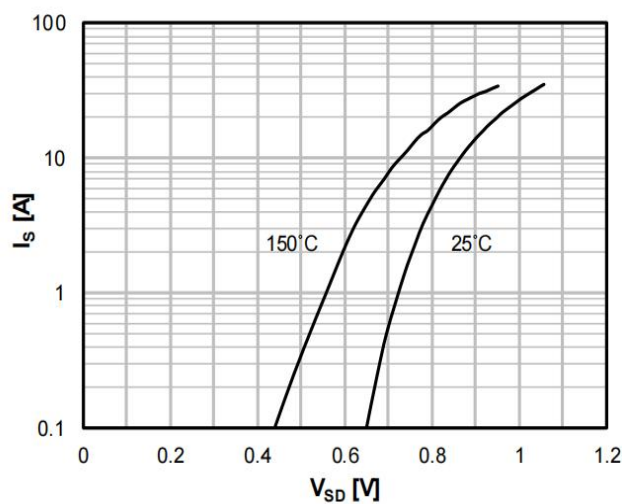
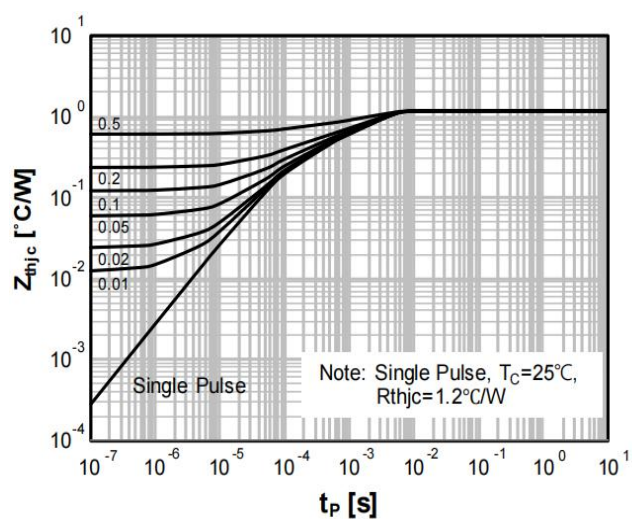
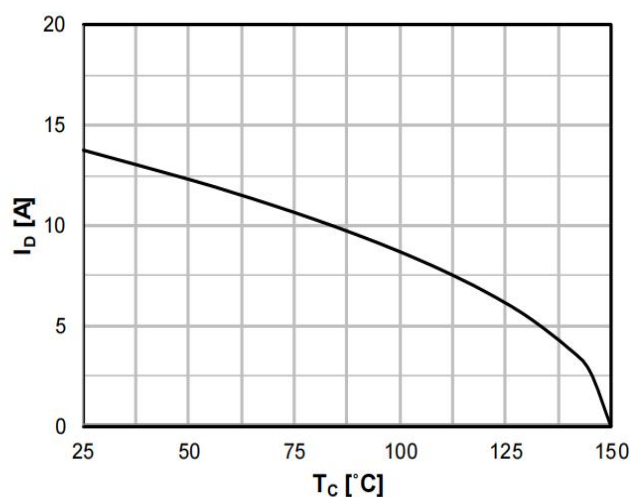
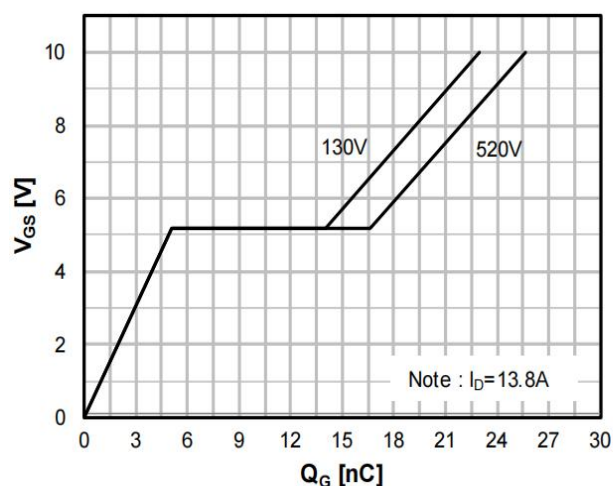
Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	BV_{DSS}	650	-	-	V
Drain-Source Leakage Current	$V_{DS} = 650\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	-	-	1	μA
Gate Leakage Current	$V_{GS} = \pm 30\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	$V_{GS(th)}$	2.5	-	4.5	V
Drain-Source On-State Resistance	$V_{GS} = 10\text{ V}, I_D = 4.4\text{ A}$	$R_{DS(ON)}$	-	238	280	m Ω
Input Capacitance	$V_{DS} = 50\text{ V}$ $V_{GS} = 0\text{ V}$ $f = 400\text{ KHz}$	C_{iss}	-	1720	-	pF
Output Capacitance		C_{oss}	-	79	-	
Reverse Transfer Capacitance		C_{rss}	-	5	-	
Turn-on Delay Time(Note2)	$V_{DD} = 325\text{ V}$	$t_{d(on)}$	-	19	-	ns
Rise Time(Note2)	$I_D = 13.8\text{ A}$	T_r	-	34	-	
Turn-Off Delay Time(Note2)	$V_{GS} = 10\text{ V}$	$t_{d(OFF)}$	-	76	-	
Fall Time(Note2)	$R_G = 25\Omega$	t_f	-	27	-	
Total Gate Charge(Note2)	$V_{DS} = 520\text{ V}$ $V_{GS} = 10\text{ V}$ $I_D = 13.8\text{ A}$	Q_g	-	23	-	nC
Gate to Source Charge(Note2)		Q_{gs}	-	5	-	
Gate to Drain Charge(Note2)		Q_{gd}	-	9	-	
Reverse recovery time	$I_{SD} = 13.8\text{ A}$ $V_{DD} = 100\text{ V}$ $di/dt = 100\text{ A/us}$	t_{rr}	-	300	-	ns
Reverse recovery current		I_{rr}	-	24	-	A
Reverse recovery charge		Q_{rr}		3.6		μC
Drain-Source Diode Forward Voltage	$V_{GS} = 0\text{ V}, I_S = 13.8\text{ A}, T_J = 25^\circ\text{C}$	V_{SD}	-	1.4	-	V

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

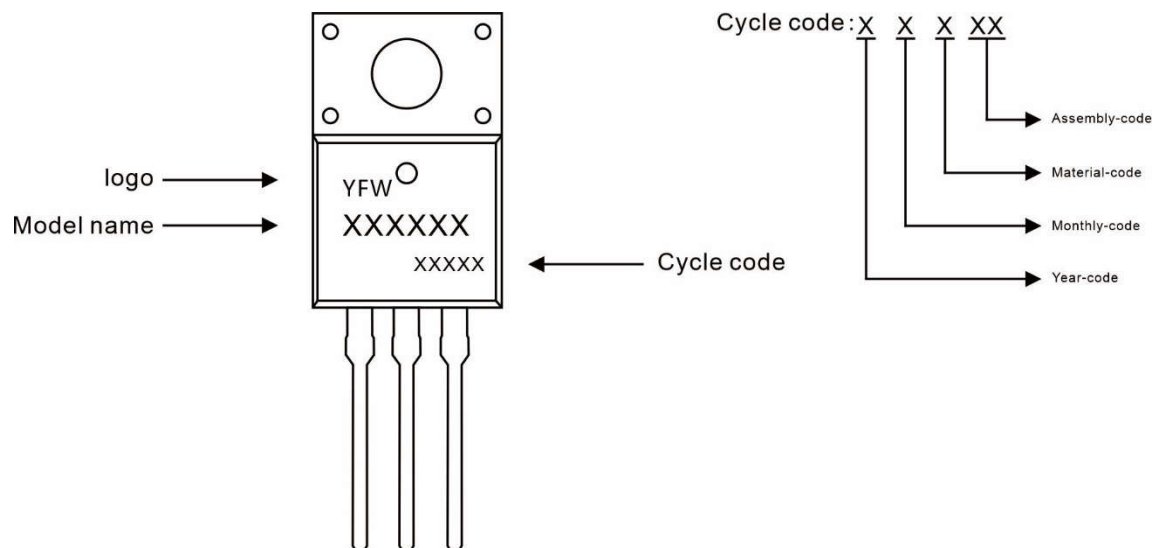
Ratings and Characteristic Curves



Ratings and Characteristic Curves



Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW65R280AF	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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