

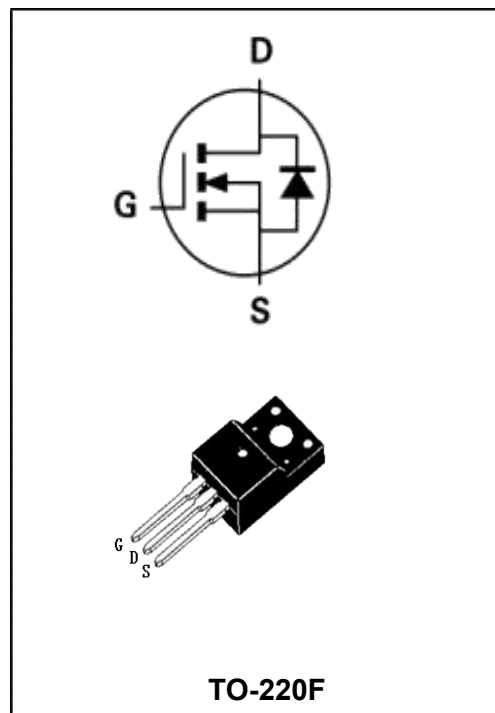
650V N-channel Super Junction MOSFET

MAIN CHARACTERISTICS

I_D	20A
V_{DS}	650V
$R_{DS(on)-typ}(@V_{GS}=10V)$	<190mΩ (Type:150mΩ)

APPLICATIONS

- ♦ 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℃ maximum,10s per JESD 22-B106

Product Specification Classification

Part Number	Package	Marking	Pack
YFW65R190AF	TO-220F	YFW 65R190AF XXXXX	1000pcs/box

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	20	A
Pulsed Drain Current (Note1)	I_{DM}	60	A
Power Dissipation	P_D	34	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	650	mJ
Operating Temperature Range	T_J	-50 to +150	°C
Storage Temperature Range	T_{STG}	-50 to +150	°C
Thermal Resistance, Junction to Case	$R_{\theta_{JC}}$	3.7	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta_{JA}}$	80	°C/W

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

Electrical Characteristics at Tc=25°C unless otherwise specified

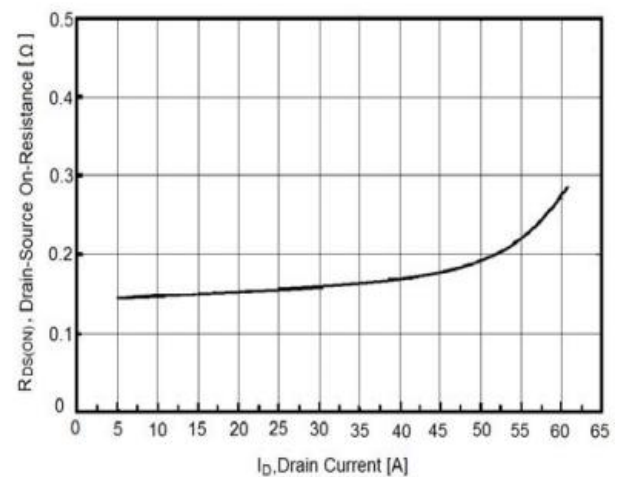
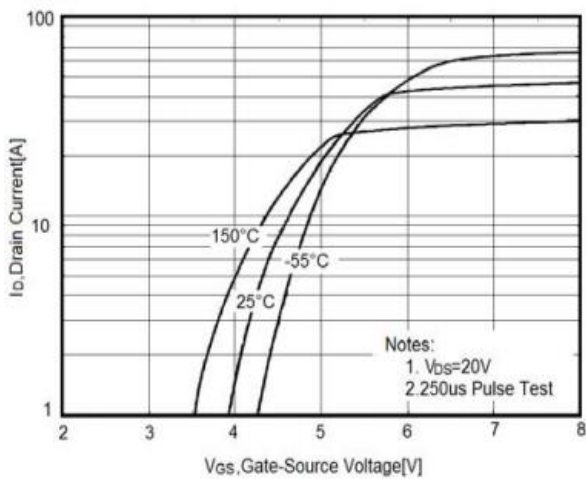
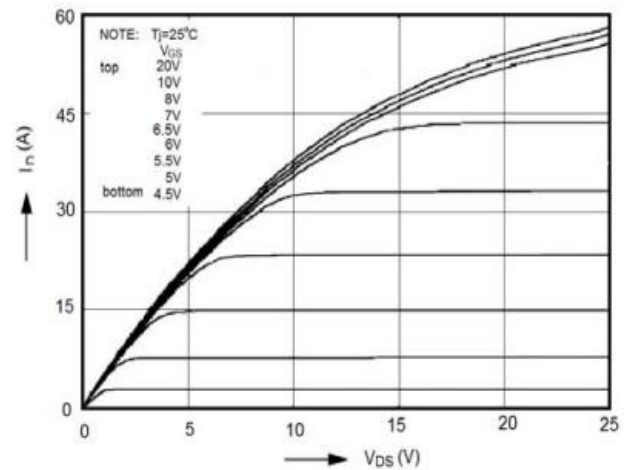
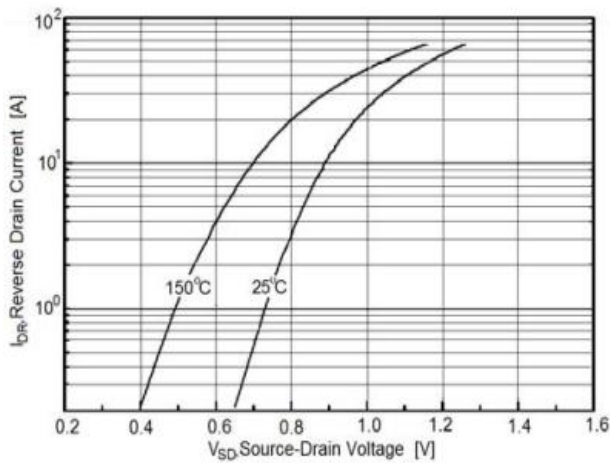
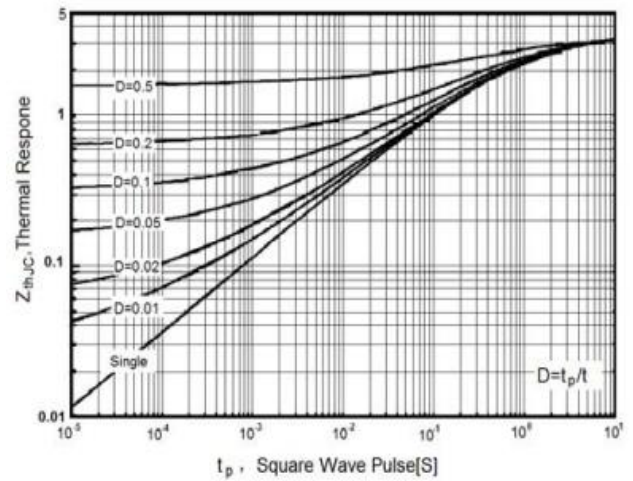
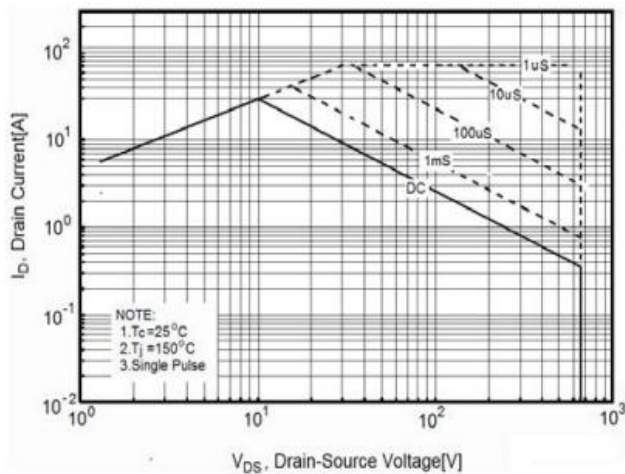
Characteristics	Test Condition	Symbo	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	BV_{DSS}	650	-	-	V
Drain-Source Leakage Current	$V_{DS} = 650\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	-	-	1	μA
Gate Leakage Current	$V_{GS} = \pm 30\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	$V_{GS(th)}$	2	-	4	V
Drain-Source On-State Resistance	$V_{GS} = 10\text{ V}, I_D = 1\text{ A}$	$R_{DS(on)}$	-	150	190	m Ω
Forward Transconductance	$V_{DS} = 40\text{ V}, I_D = 10\text{ A}$	g_{fs}	-	17	-	S
Input Capacitance	$V_{DS} = 50\text{ V}, V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}$	C_{iss}	-	1960	-	pF
Output Capacitance		C_{oss}	-	150	-	pF
Reverse Transfer Capacitance		C_{rss}	-	5.2	-	pF
Turn-on Delay Time(Note2)	$V_{DD} = 380\text{ V}, I_D = 10\text{ A}, V_{GS} = 10\text{ V}, R_G = 4\text{ }\Omega$	$t_{d(ON)}$	-	12	-	ns
Rise Time(Note2)		t_r	-	5.5	-	ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	60	-	ns
Fall Time(Note2)		t_f	-	4.5	-	ns
Total Gate Charge(Note2)	$V_{DS} = 480\text{ V}, V_{GS} = 10\text{ V}, I_D = 20\text{ A}$	Q_G	-	45	-	nC
Gate to Source Charge(Note2)		Q_{GS}	-	8.6	-	nC
Gate to Drain Charge(Note2)		Q_{GD}	-	18	-	nC

Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified

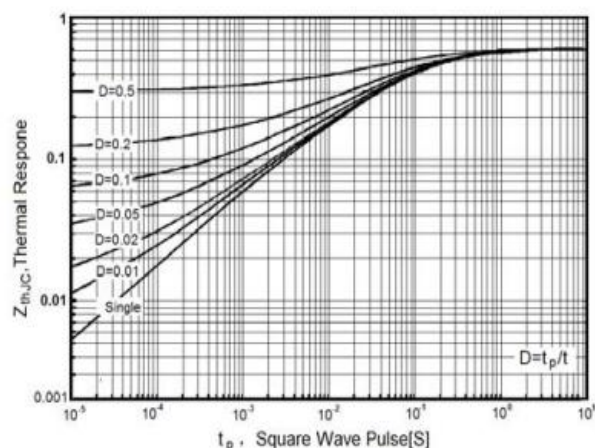
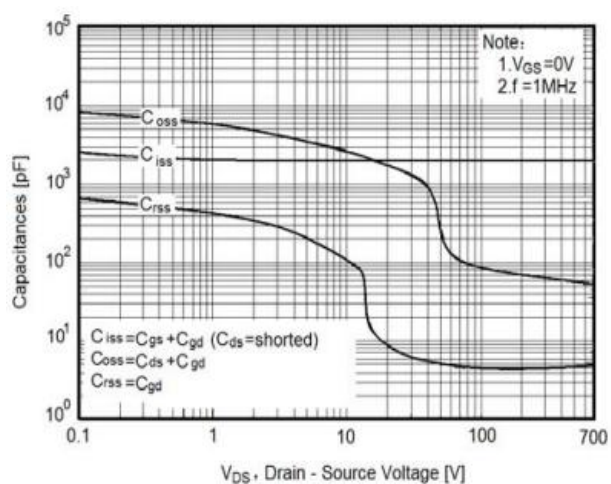
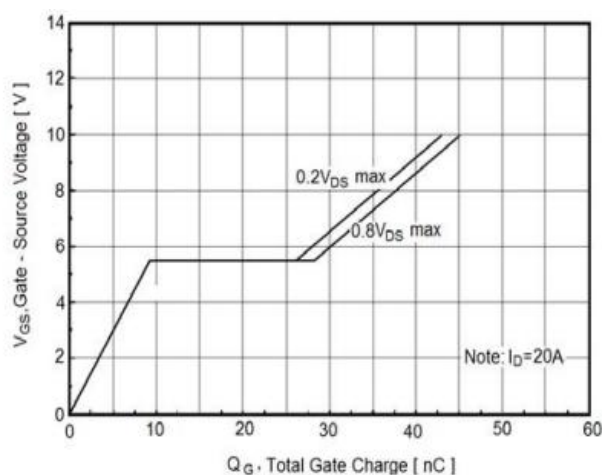
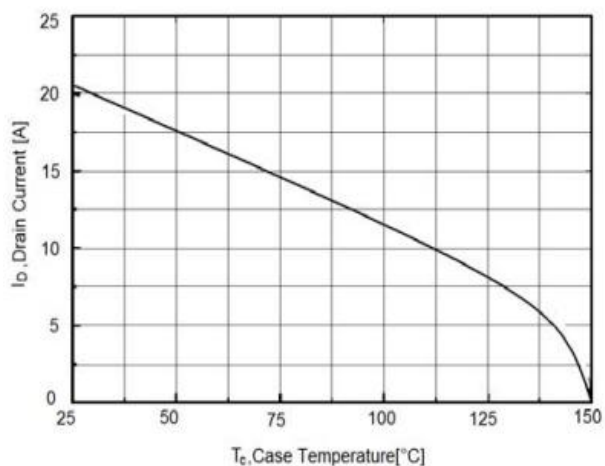
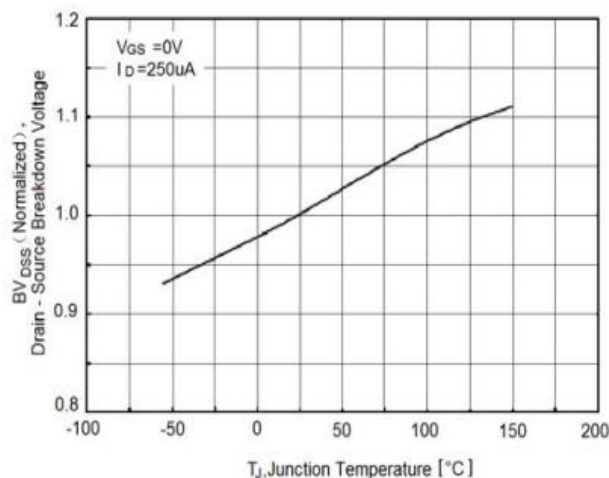
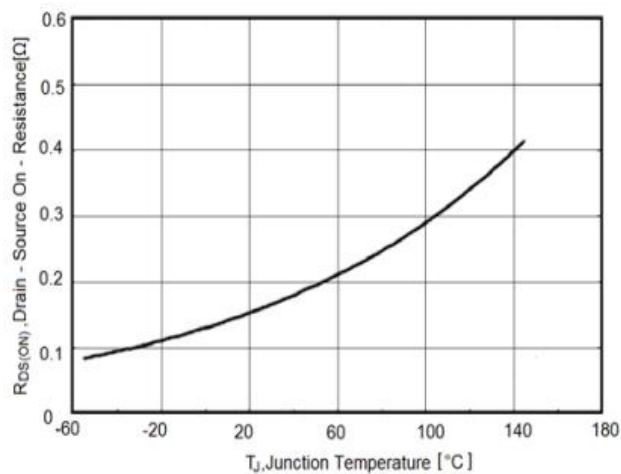
Characteristics	Test Condition	Symbo	Min.	Typ.	Max.	Unit
Maximum Continuous Drain -Source Diode Forward Current		I_S	-	-	20	A
Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}	-	-	60	A
Reverse recovery time	$T_J = 25^\circ\text{C}, I_F = 21\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$	t_{rr}	-	300	-	ns
Reverse recovery charge		Q_{rr}	-	5	-	μC
Drain-Source Diode Forward Voltage	$V_{GS} = 0\text{ V}, I_S = 20\text{ A}, T_J = 25^\circ\text{C}$	V_{SD}	-	-	1.3	V

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

RATINGS AND CHARACTERISTIC CURVES

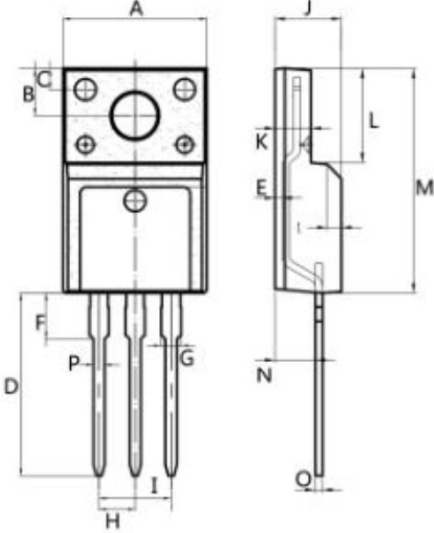


RATINGS AND CHARACTERISTIC CURVES



Package Outline Dimensions Millimeters

TO-220F

	Dim.	Min.	Max.
	A	9.95	10.25
	B	2.95	3.25
	C	1.25	1.45
	D	12.95	13.25
	E	0.50	0.65
	F	3.1	3.3
	G	1.30	1.45
	H	Typ 2.54	
	I	Typ 5.08	
	J	4.60	4.75
	K	2.50	2.65
	L	6.35	6.55
	M	15.4	16.0
	N	2.75	3.05
	O	0.48	0.52
	P	0.76	0.84
	All Dimensions in millimeter		