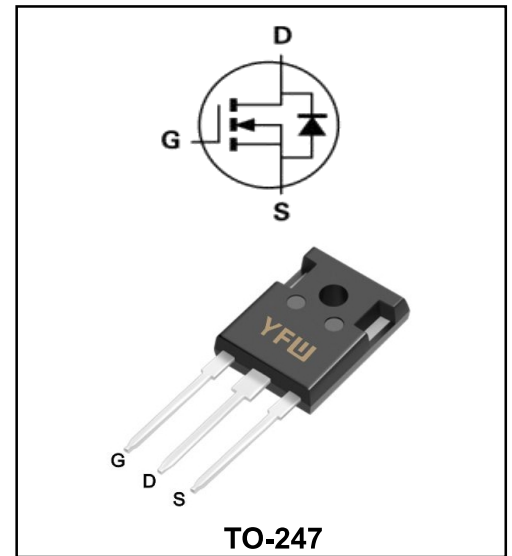


650V N-channel Super Junction MOSFET

MAIN CHARACTERISTICS

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



FEATURES

- ◆ Low RDS(on) & FM
- ◆ Extremely low switching loss
- ◆ Excellent stability and uniformity

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°C maximum, 10s per JESD 22-B106

Maximum Ratings at Tc=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	20	A
Pulsed Drain Current (Note1)	I_{DM}	60	A
Power Dissipation	P_D	200	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_{θJC}	0.62	°C/W
Thermal Resistance, Junction to Ambient	R_{θJA}	62.5	°C/W

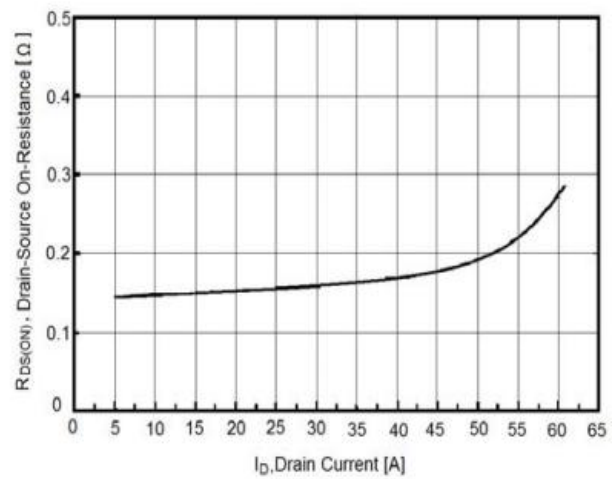
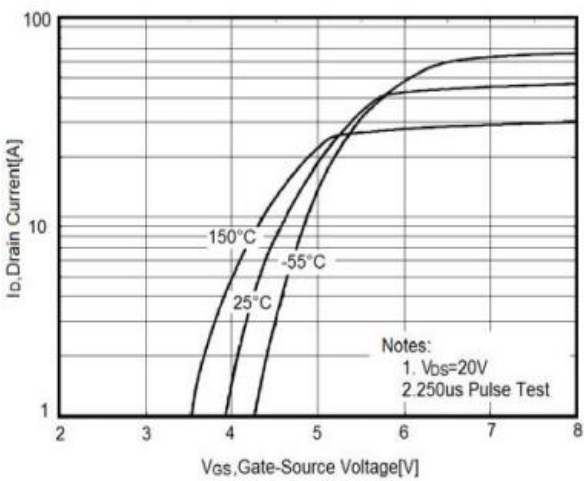
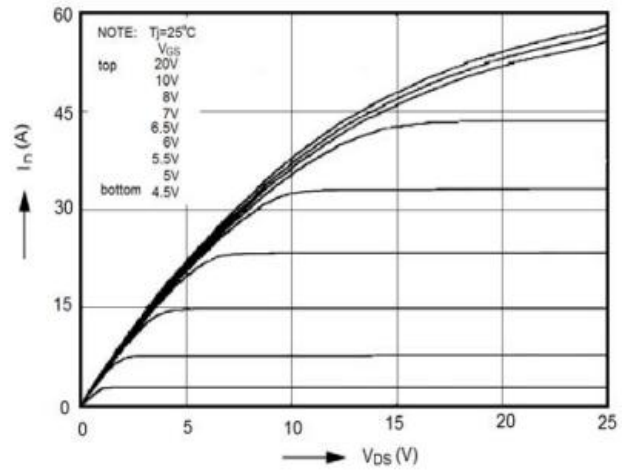
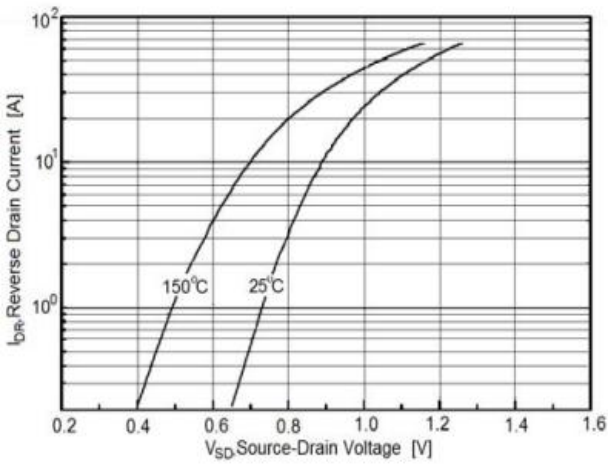
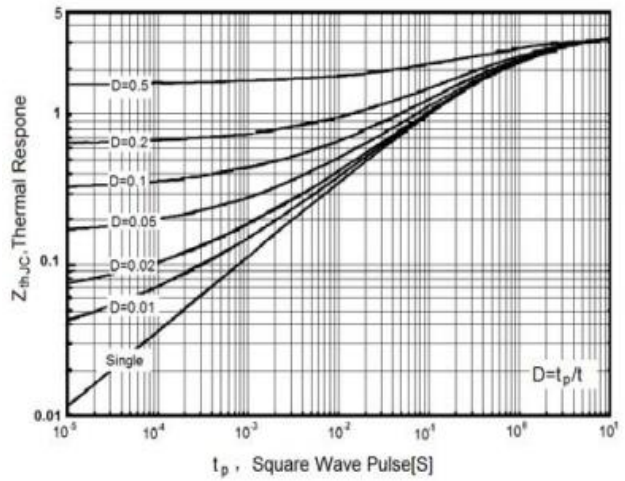
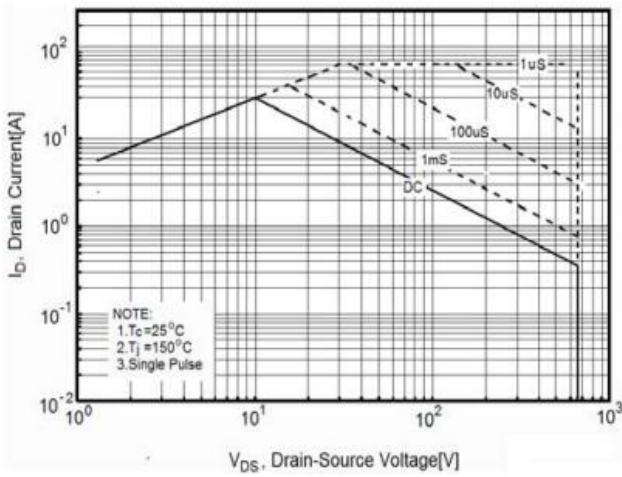
Note1:Pulse test: 300 μs pulse width, 2 % duty cycle

Maximum Ratings at Tc=25°C unless otherwise specified

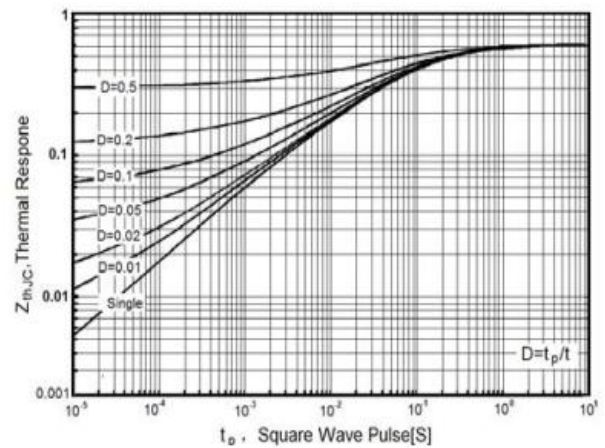
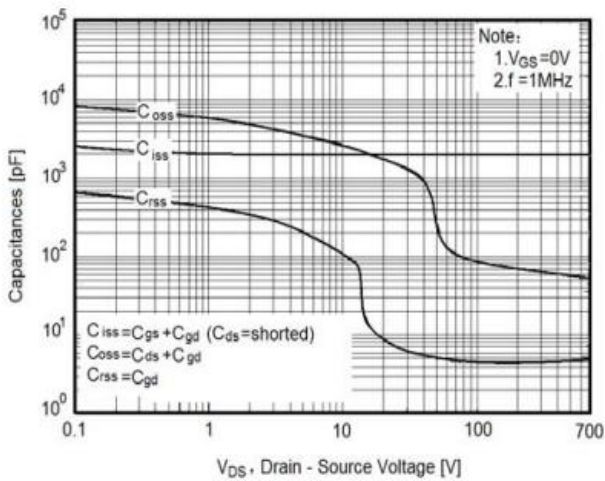
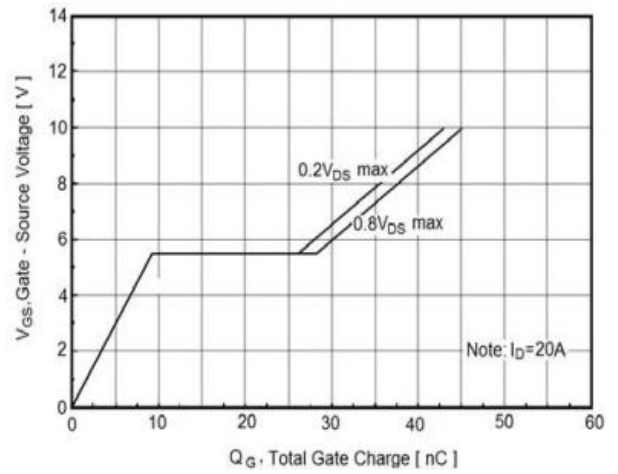
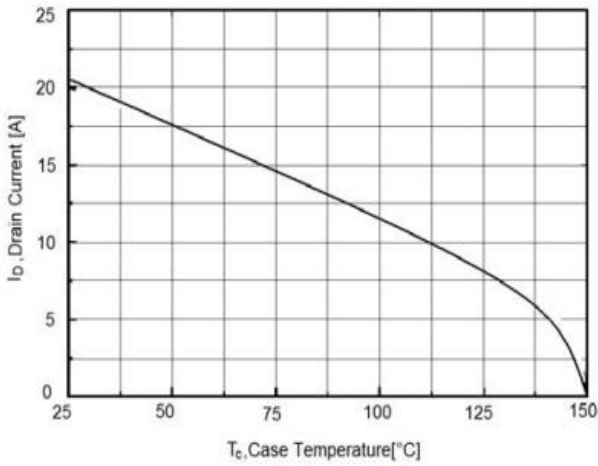
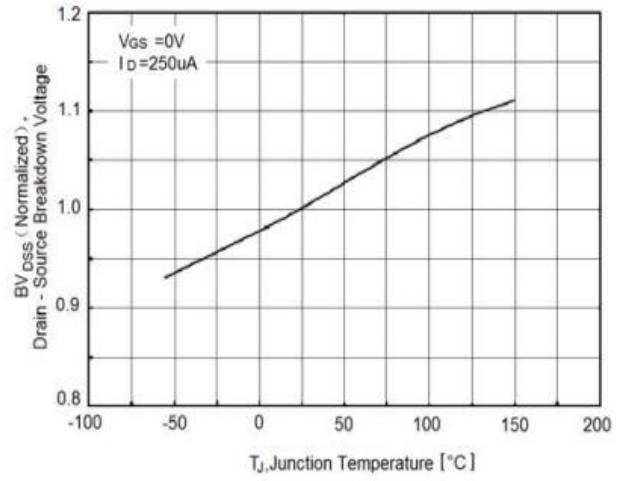
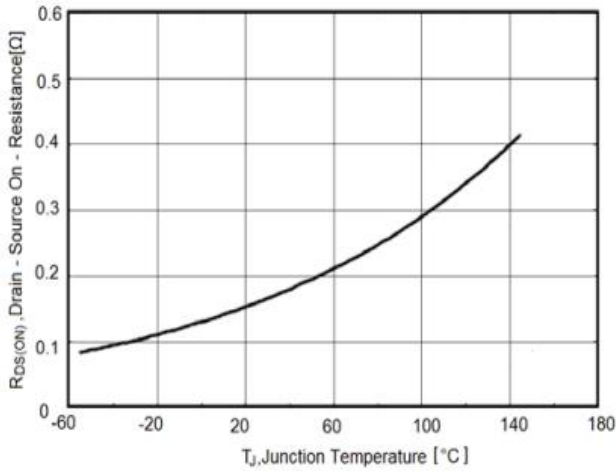
Characteristics	Test Condition	Symbo	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	BV_{DSS}	650	-	-	V
Drain-Source Leakage Current	$V_{DS} = 650V, V_{GS} = 0V$	I_{DSS}	-	-	1	μA
Gate Leakage Current	$V_{GS} = \pm 30V, V_{DS} = 0V$	I_{GSS}	-	-	±100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	V_{GS(th)}	2	-	4	V
Drain-Source On-State Resistance	$V_{GS} = 10V, I_D = 1A$	R_{DS(ON)}	-	150	190	mΩ
Forward Transconductance	$V_{DS} = 40V, I_D = 10A$	g_{fs}	-	17	-	S
Input Capacitance	$V_{DS} = 50V$ $V_{GS} = 0V$ $f = 1.0MHz$	C_{iss}	-	1960	-	pF
Output Capacitance		C_{oss}	-	150	-	pF
Reverse Transfer Capacitance		C_{rss}	-	5.2	-	pF
Turn-on Delay Time(Note2)	$V_{DD} = 380V, I_D = 10A,$ $V_{GS} = 10V, R_G = 4\Omega$	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)	$V_{DS} = 480V$ $V_{GS} = 10V$ $I_D = 20A$	Q_G	-	45	-	nC
Gate to Source Charge(Note2)		Q_{GS}	-	8.6	-	nC
Gate to Drain Charge(Note2)		Q_{GD}	-	18	-	nC
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	$T_J = 25^\circ C, I_F = 21A, di/dt = 100A/\mu s$	t_{rr}	-	300	-	ns
Reverse recovery charge		Q_{rr}	-	5	-	uC
Drain-Source Diode Forward Voltage	$V_{GS} = 0V, I_S = 20A, T_J = 25^\circ C$	V_{SD}	-	-	1.3	V

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

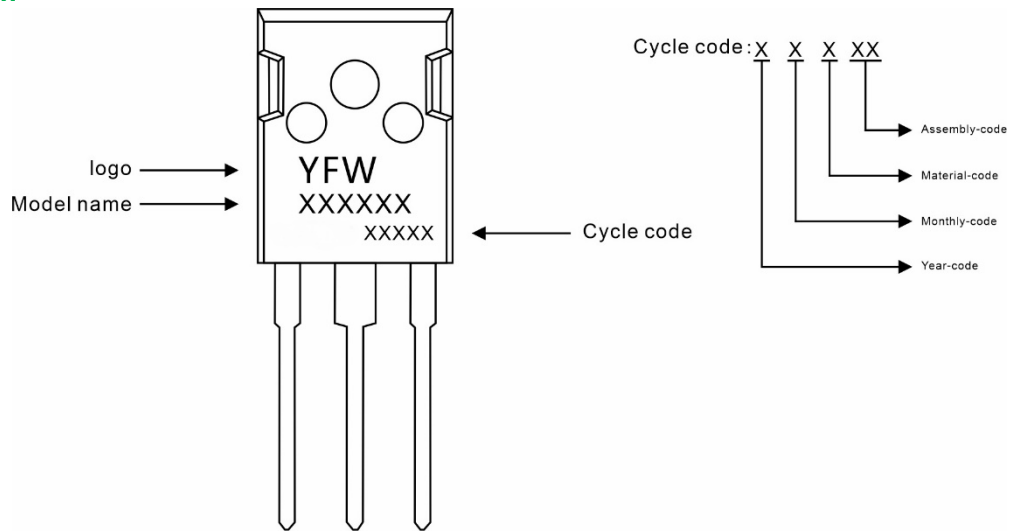
Ratings and Characteristic Curves



Ratings and Characteristic Curves



Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW65R190AP	TO-247	0.209oz(5.93g)	30pcs/tube	600PCS/Box 2400PCS/Carton

Package Dimensions

TO-247

Symbol	Dimensions in mm		Dimensions in Inch	
	Min.	Max.	Min.	Max.
A	4.90	5.10	0.193	0.201
A1	1.90	2.10	0.075	0.083
A2	2.29	2.54	0.090	0.100
b	1.00	1.40	0.039	0.055
b1	2.00	2.20	0.079	0.087
b2	3.00	3.20	0.118	0.126
c	0.50	0.70	0.020	0.028
D	15.75	16.05	0.620	0.632
E	20.20	20.80	0.795	0.819
e	5.45 (BSC)		0.215 (BSC)	
e1	10.90 (BSC)		0.429 (BSC)	
F	6.05	6.25	0.238	0.246
F1	5.80	6.00	0.228	0.236
L	20.10	20.40	0.791	0.803
L1	4.05	4.35	0.159	0.171
Φ	3.50	3.70	0.138	0.146

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