

150V N-Channel Enhancement Mode MOSFET

MAIN CHARACTERISTICS

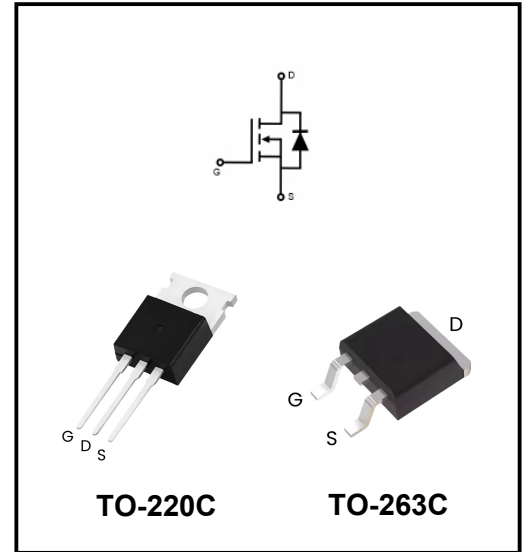
I_D	220A
V_{DSS}	150V
$R_{DS(on)-typ}(@V_{GS}=10V)$	$<4.8m\Omega$ (Typ: 4 m Ω)

APPLICATIONS

- ♦ Ultra-low $R_{DS(ON)}$
- ♦ Low Gate Charge
- ♦ High Current Capability
- ♦ **YFW-SGT technology**

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 $T_c=25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	150	V
Gate - Source Voltage	V_{GS}	± 20	V
Continue Drain Current	I_D	220	A
Pulsed Drain Current (Note1)	I_{DM}	840	A
Total Power Dissipation	P_D	500	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	889	mJ
Operating Junction Temperature Range	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.36	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	45	$^\circ\text{C/W}$

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

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	150	-	-	V
Drain-Source Leakage Current	$V_{DS} = 80 V, V_{GS} = 0 V$	I_{DSS}	-	-	1	μA
Gate Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	-	-	± 100	nA
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	2.5	-	4.5	V
Drain-Source on-Resistance (Note 3)	$V_{GS}=10V, I_D=20A$	$R_{DS(ON)}$	-	4	4.8	m Ω
Input Capacitance	$V_{DS}=75V$ $V_{GS}=0V$ $f=1MHz$	C_{iss}	-	6535	-	pF
Output Capacitance		C_{oss}	-	772	-	
Reverse Transfer Capacitance		C_{rss}	-	6.7	-	
Total Gate Charge	$V_{DS}=20V$ $V_{GS}=10V$ $I_D=20A$	Q_g	-	87	-	nC
Gate-Source Charge		Q_{gs}	-	33	-	
Gate-Drain Charge		Q_{gd}	-	18	-	
Turn-on delay time	$V_{DS} = 75V$ $V_{GS}=10V$ $R_G = 3.75\Omega$	$t_{d(on)}$	-	49	-	ns
Rise Time		T_r	-	91	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	95	-	
Fall Time		t_f	-	61	-	
Body Diode Reverse Recovery Time(Note2)	$T_J = 25^\circ C, I_F = 15A$ $di / dt = 100 A/\mu s$	t_{rr}	-	122	-	ns
Body Diode Reverse Recovery Charge(Note2)		Q_{rr}	-	279	-	nC
Drain-Source Diode Forward Voltage	$V_{GS}=0V, I_S=100A, T_J=25^\circ C$	V_{SD}	-	-	1.2	V
Maximun Body-Diode Continuous Current		I_S	-	-	220	A

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

Ratings and Characteristic Curves

Figure 1: Saturation Characteristics

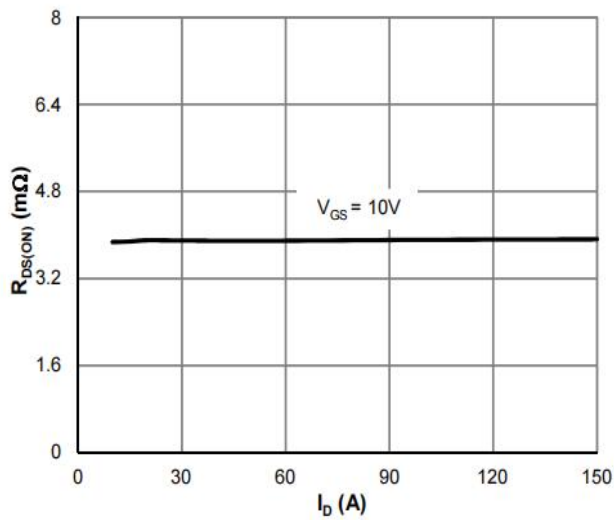


Figure 2: Transfer Characteristics

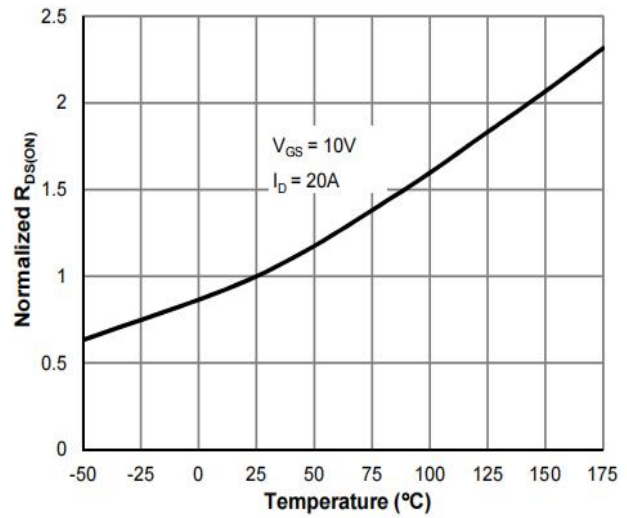


Figure 3: $R_{DS(ON)}$ vs. Drain Current

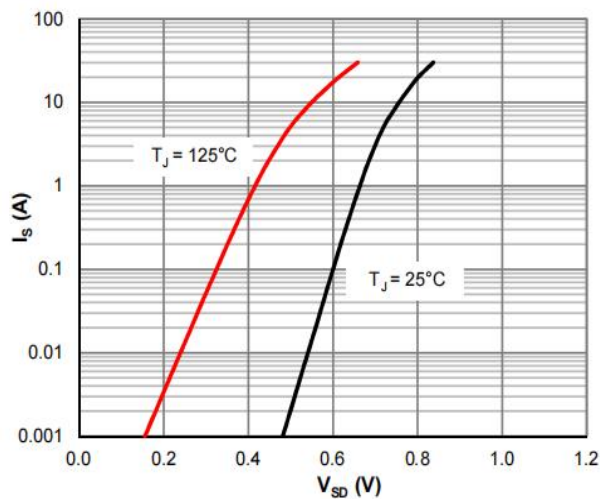


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

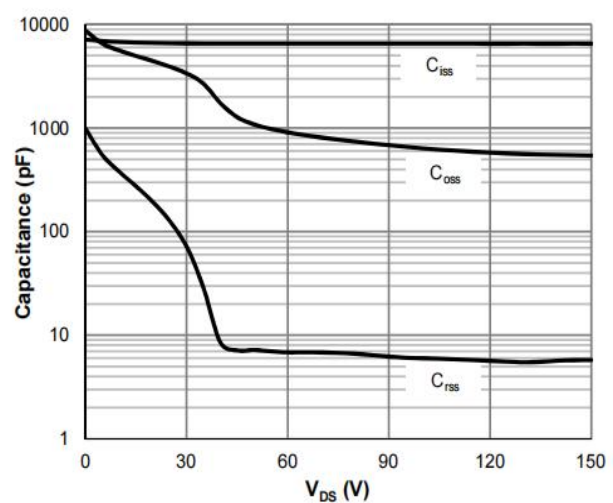


Figure 5: Body-Diode Characteristics

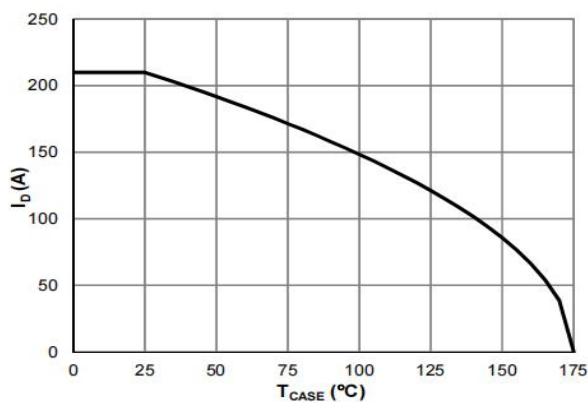
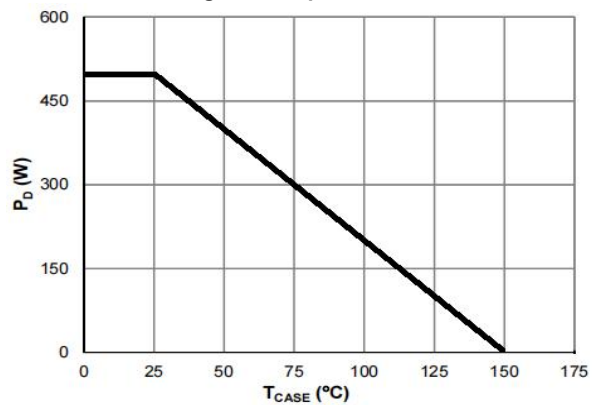


Figure 6: Capacitance Characteristics



Ratings and Characteristic Curves

Figure 7: Current De-rating

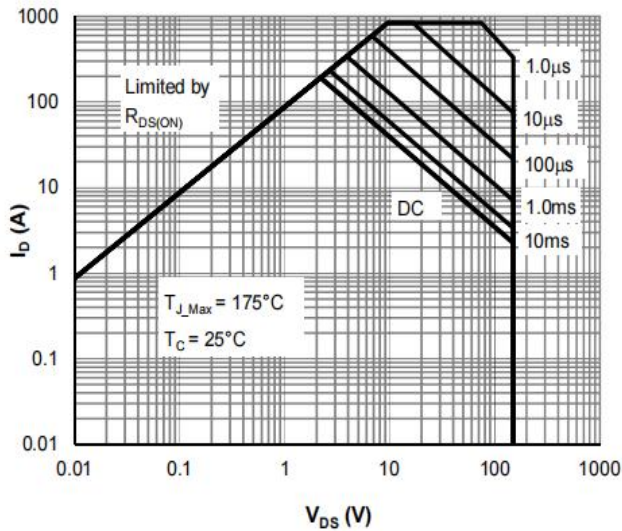


Figure 8: Power De-rating

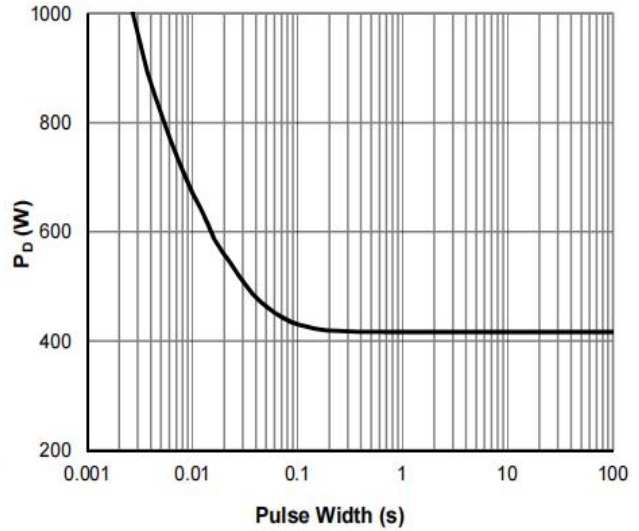


Figure 9: Maximum Safe Operating Area

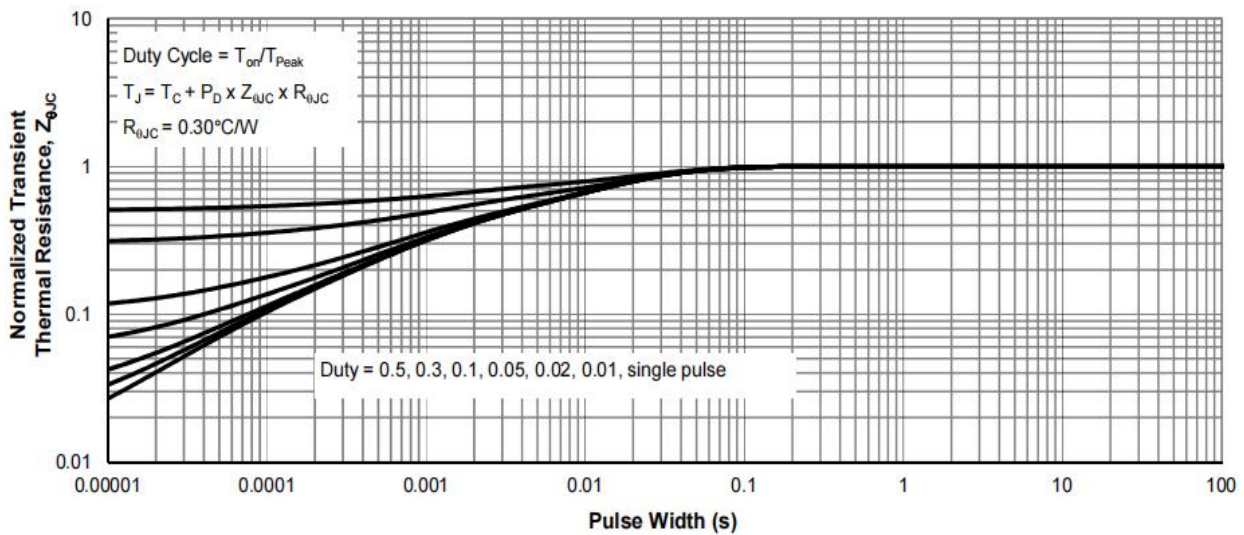
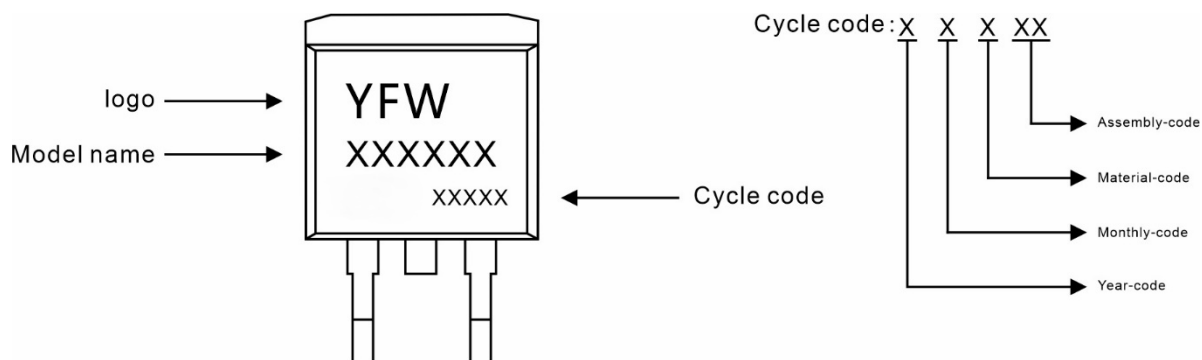
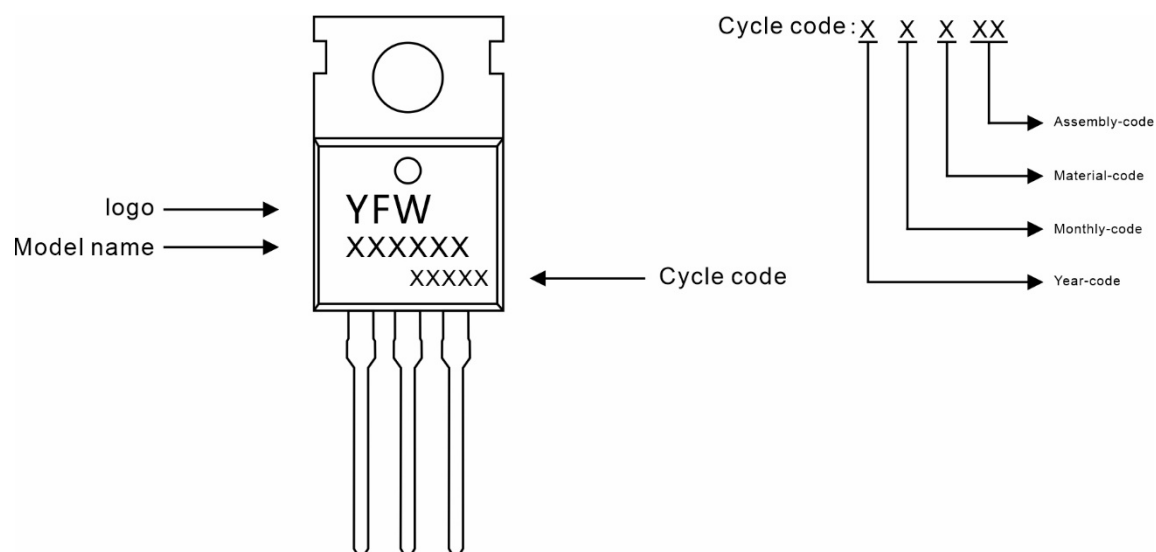


Figure 10: Single Pulse Power Rating, Junction-to-Case

Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWG220N15AC	TO-220C	0.07oz(1.96g)	50pcs/tube	1000PCS/Box 5000PCS/Carton
YFWG220N15ASC	TO-263C	0.04oz(1.16g)	800PCS/Reel	1600PCS/Box 4000PCS/Carton

Package Dimensions

TO-220C

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.34	4.67	0.171	0.184
A1	2.52	2.82	0.099	0.111
b	0.71	0.91	0.028	0.036
b1	1.17	1.37	0.046	0.054
c	0.30	0.50	0.012	0.020
c1	1.17	1.37	0.046	0.054
D	9.90	10.20	0.390	0.402
E	8.50	8.90	0.335	0.350
E1	12.00	12.50	0.472	0.492
e	2.44	2.64	0.096	0.104
e1	4.88	5.28	0.192	0.208
F	2.60	2.80	0.102	0.110
L	13.20	13.80	0.520	0.543
L1	3.80	4.20	0.150	0.165
Φ	3.60	3.96	0.142	0.156

TO-263C

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.30	4.70	0.169	0.185
A1	0.00	0.15	0.000	0.006
A2	4.30	4.55	0.169	0.179
B	1.10	1.50	0.043	0.059
b	0.70	0.90	0.028	0.035
b1	1.20	1.50	0.047	0.059
c	0.30	0.60	0.012	0.024
c1	1.17	1.37	0.046	0.054
D	9.90	10.20	0.390	0.402
E	8.50	8.90	0.335	0.350
e	2.44	2.64	0.096	0.104
e1	4.88	5.28	0.192	0.208
L	15.00	15.30	0.591	0.602
L1	5.20	5.40	0.205	0.213
L2	2.40	2.60	0.094	0.102
L3	1.60	1.80	0.063	0.071

Disclaimer

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