

**500V N-CHANNEL ENHANCEMENT MODE MOSFET**

**MAIN CHARACTERISTICS**

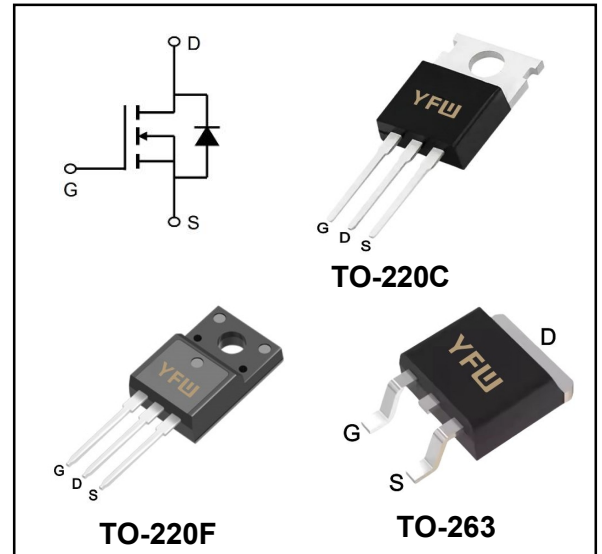
$I_D$	10A
$V_{DSS}$	500V
$R_{DS(ON)-typ}(@V_{GS}=10V)$	<0.66Ω (Type:0.45Ω)

**Features**

- ◆Fast Switching
- ◆Low ON Resistance
- ◆Low Gate Charge
- ◆100% Single Pulse avalanche energy Test
- ◆LeadfreeincomplywithEURoHS2011/65/EUdirectives

**Mechanical Data**

- ◆Case: Molded plastic
- ◆Mounting Position: Any
- ◆Molded Plastic: UL Flammability Classification Rating 94V-0
- ◆Solder bath temperature275℃maximum,10s per JESD22-106



**Maximum Ratings at Tc=25°C unless otherwise specified**

Characteristics	Symbols	Value			Units
		220C	220F	263	
Drain-Source Voltage	<b>V<sub>DS</sub></b>	500			<b>V</b>
Gate-Source Voltage	<b>V<sub>GS</sub></b>	±30			<b>V</b>
Continue Drain Current-Continuous (TC = 25°C)	<b>I<sub>D</sub></b>	10			<b>A</b>
-Continuous (TC = 100°C)		6			
Pulsed Drain Current (Note1)	<b>I<sub>DM</sub></b>	40			<b>A</b>
Power Dissipation	<b>P<sub>D</sub></b>	143	48	140	<b>W</b>
-Derate above 25°C		1.14	0.38	1.14	<b>W/°C</b>
Single Pulse Avalanche Energy (Note2)	<b>E<sub>AS</sub></b>	650			<b>mJ</b>
Avalanche Current (Note 1)	<b>I<sub>AR</sub></b>	10			<b>A</b>
Repetitive Avalanche Energy (Note 1)	<b>E<sub>AS</sub></b>	14			<b>mJ</b>
Operating Temperature Range	<b>T<sub>J</sub></b>	150			<b>°C</b>
Storage Temperature Range	<b>T<sub>STG</sub></b>	-55 to +150			<b>°C</b>
Thermal Resistance, Junction to Case	<b>R<sub>θJC</sub></b>	0.92	2.68	0.92	<b>°C/W</b>
Thermal Resistance, Junction to Ambient	<b>R<sub>θJA</sub></b>	62.5	62.5	62.5	<b>°C/W</b>

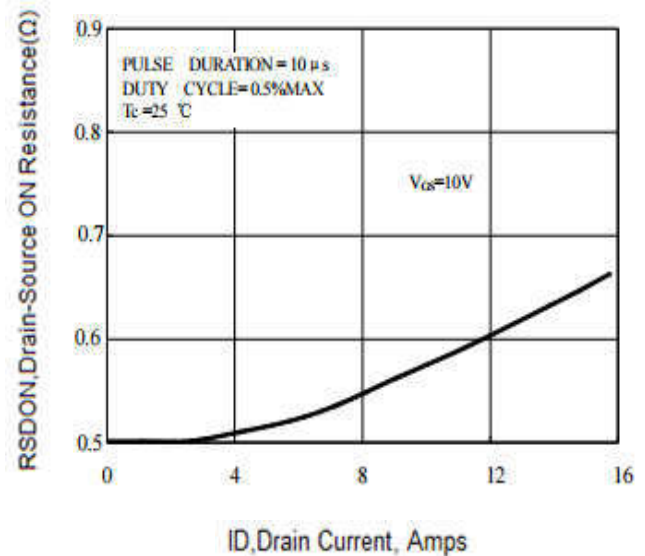
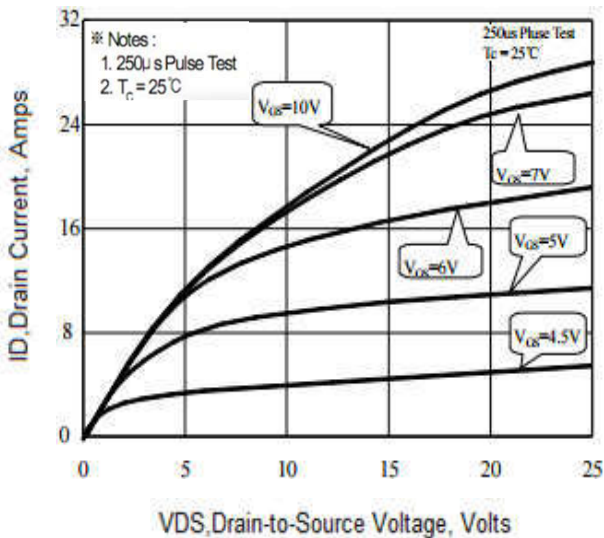
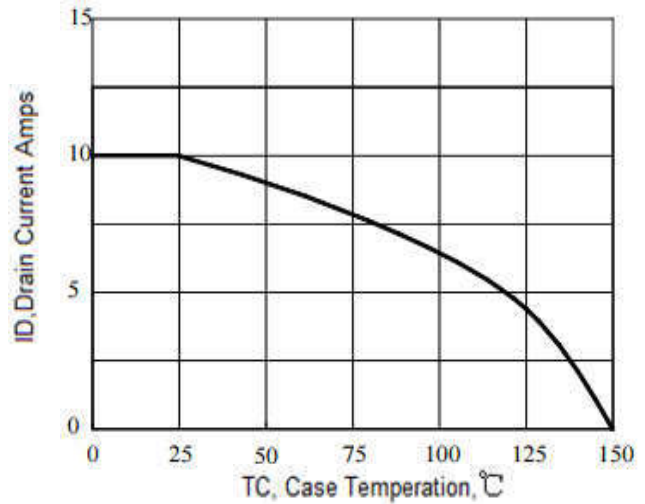
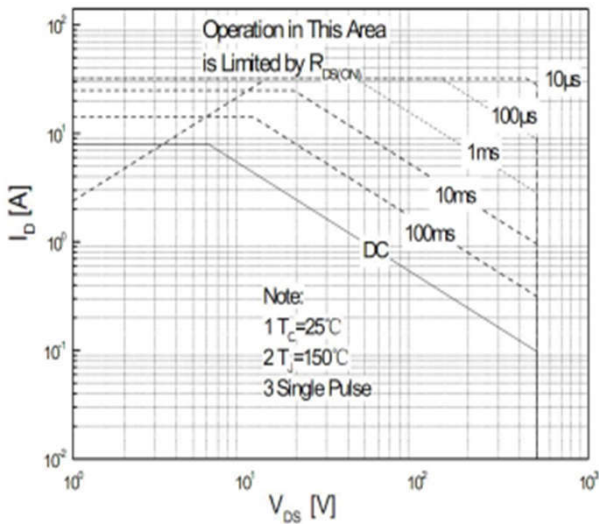
**Maximum Ratings at Tc=25°C unless otherwise specified**

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	<b>BV<sub>DSS</sub></b>	500	-	-	<b>V</b>
Drain-Source Leakage Current	V <sub>DS</sub> = 500 V, V <sub>GS</sub> = 0 V	<b>I<sub>DSS</sub></b>	-	-	1	<b>uA</b>
	V <sub>DS</sub> = 400 V, T <sub>c</sub> = 125°C		-	-	10	
Gate Leakage Current	V <sub>GS</sub> = ± 30 V, V <sub>DS</sub> = 0 V	<b>I<sub>GSS</sub></b>	-	-	±100	<b>nA</b>
Gate-Source Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	<b>V<sub>GS(th)</sub></b>	2	-	4	<b>V</b>
Drain-Source On-State Resistance	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 5 A	<b>R<sub>DS(on)</sub></b>	-	0.45	0.66	<b>Ω</b>
Forward Transconductance(Note3)	V <sub>DS</sub> = 40 V, I <sub>D</sub> = 5 A	<b>g<sub>fs</sub></b>	-	10	-	<b>S</b>
Input Capacitance	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, f = 1MHz	<b>C<sub>iss</sub></b>	-	1620	-	<b>pF</b>
Output Capacitance		<b>C<sub>oss</sub></b>	-	156	-	
Reverse Transfer Capacitance		<b>C<sub>rss</sub></b>	-	7	-	
Turn-on Delay Time	I <sub>D</sub> = 10 A, V <sub>DD</sub> = 250 V, R <sub>G</sub> = 25Ω(Note3,4)	<b>td(ON)</b>	-	25	-	<b>nS</b>
Rise Time		<b>tr</b>	-	20	-	
Turn-Off Delay Time		<b>td(OFF)</b>	-	50	-	
Fall Time		<b>tf</b>	-	20	-	
Total Gate Charge	I <sub>D</sub> = 10 A, V <sub>DD</sub> = 400V, V <sub>GS</sub> = 10 V(Note3,4)	<b>Q<sub>G</sub></b>	-	32	-	<b>nC</b>
Gate to Source Charge		<b>Q<sub>GS</sub></b>	-	8	-	
Gate to Drain Charge		<b>Q<sub>GD</sub></b>	-	12	-	

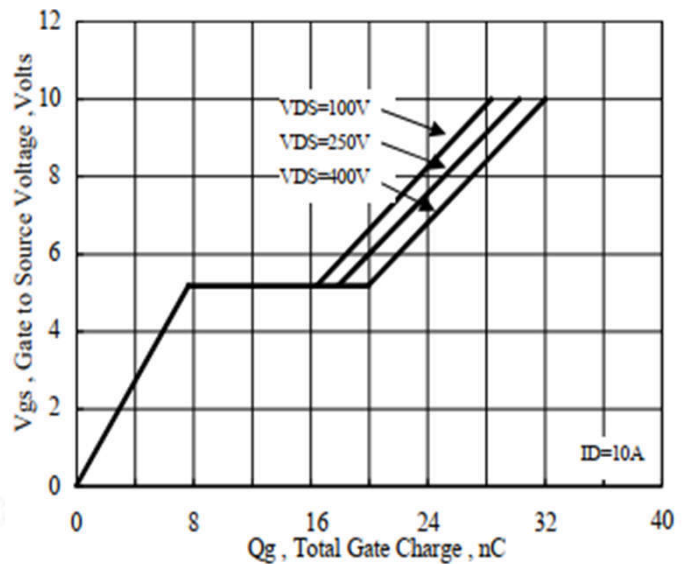
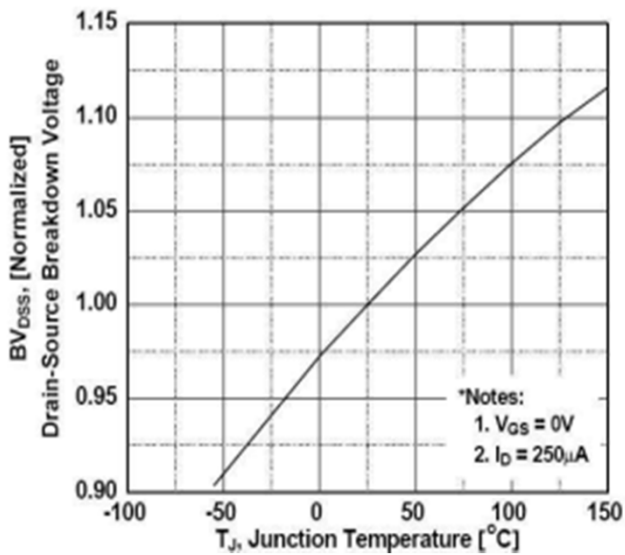
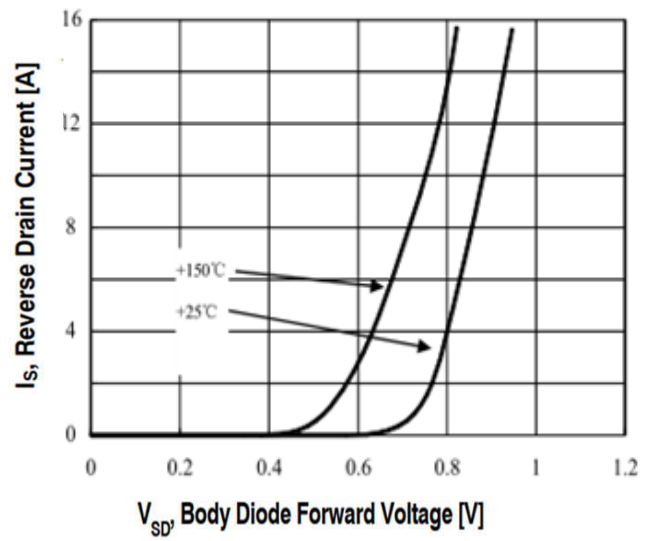
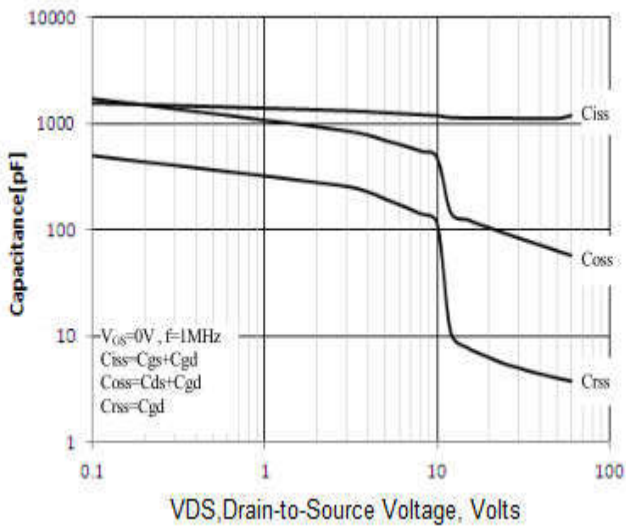
**Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified**

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Maximum Continuous Drain-Source Diode Forward Current		<b>I<sub>S</sub></b>	-	-	10	<b>A</b>
Maximum Pulsed Drain-Source Diode Forward Current		<b>I<sub>SM</sub></b>	-	-	40	<b>A</b>
Drain-Source Diode Forward Voltage	I <sub>SD</sub> = 10 A	<b>V<sub>SD</sub></b>	-	-	1.4	<b>V</b>
Reverse Recovery Time	I <sub>SD</sub> = 10 A, V <sub>GS</sub> = 0 V, dI <sub>F</sub> / dt = 100 A/μs (Note3)	<b>trr</b>	-	398	-	<b>nS</b>
Reverse Recovery Charge		<b>Qrr</b>	-	2.5	-	<b>uC</b>

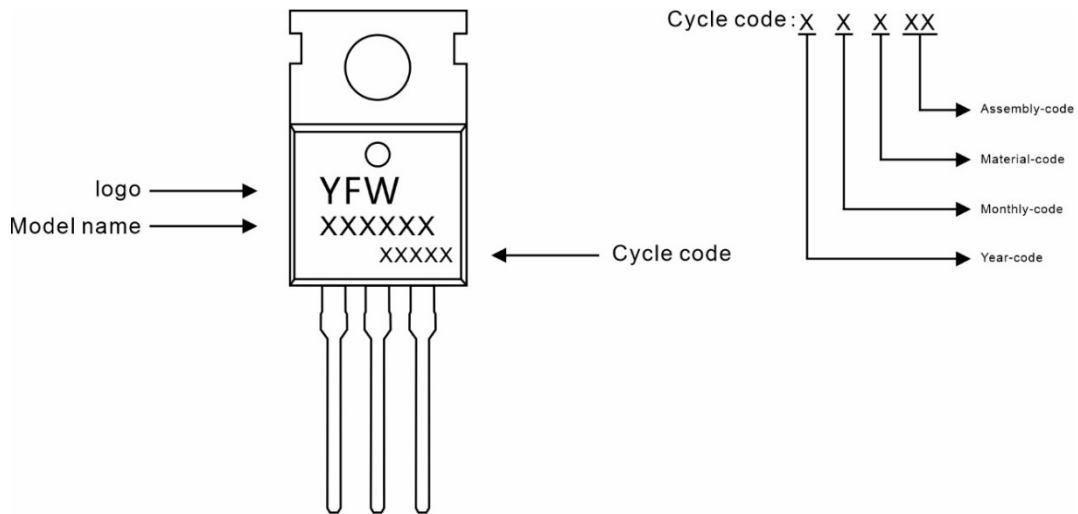
**Ratings and Characteristic Curves**



**Ratings and Characteristic Curves**



**Marking Diagram**



**Ordering information**

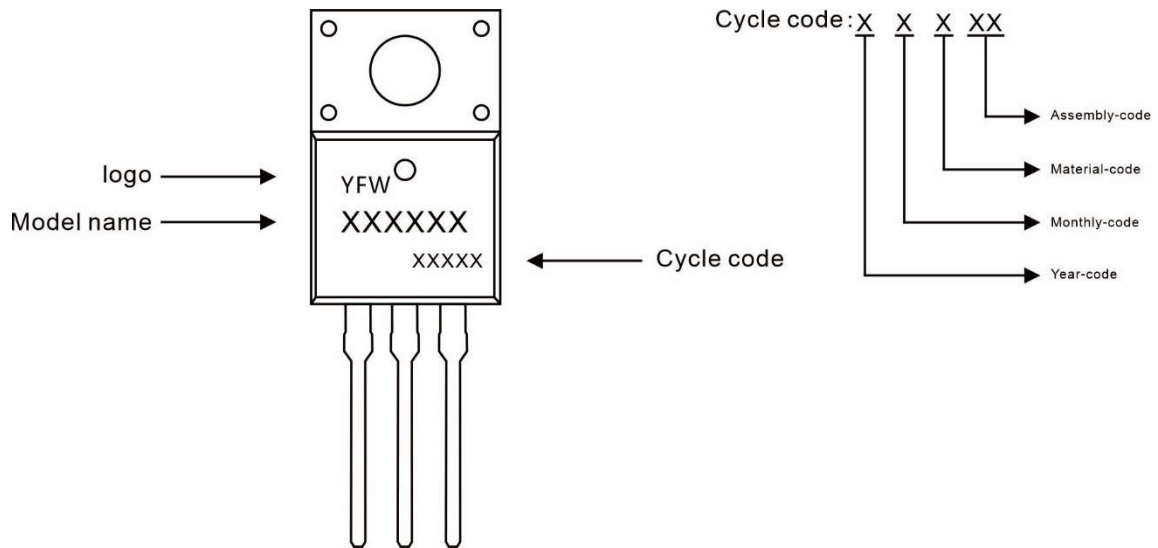
Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW10N50BC	TO-220C	0.07oz(1.96g)	50pcs/tube	1000PCS/Box 5000PCS/Carton

**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

**Marking Diagram**



**Ordering information**

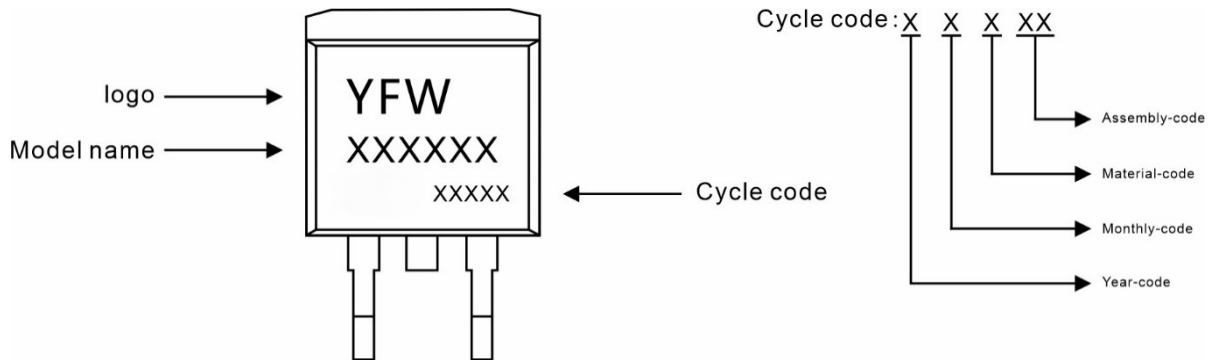
Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW10N50BF	TO-220F	0.06oz(1.74g)	50pcs/tube	1000PCS/Box 5000PCS/Carton

**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

**Marking Diagram**



**Ordering information**

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW10N50BS	TO-263	0.04oz(1.16g)	800pcs/reel	1600pcs/box 8000pcs/Carton

**Package Dimensions**

TO-263

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

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