

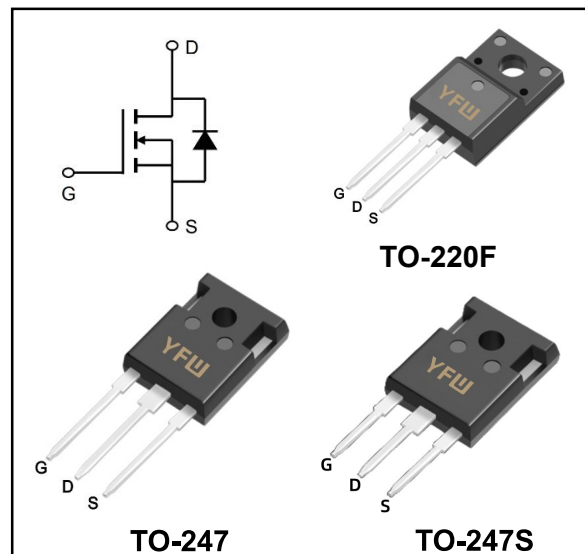
500V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	16A
V_{DSS}	500V
$R_{DS(on)}=typ(@V_{GS}=10V)$	$<0.4\Omega$ (Type: 0.33 Ω)

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 temperature 275°C maximum, 10s per JESD22-106

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

Characteristics	Symbols	Value		Units
		220F	247/247S	
Drain-Source Voltage	V _{DS}	500		V
Gate-Source Voltage	V _{GS}	±30		V
Continue Drain Current	I _D	16		A
-Continuous (TC = 100°C)		10		
Pulsed Drain Current (Note1)	I _{DM}	64		A
Power Dissipation	P _D	45	230	W
-Derate above 25°C		0.4	1.14	W/°C
Single Pulse Avalanche Energy (Note2)	E _{AS}	1000		mJ
Avalanche Current (Note 1)	I _{AR}	16		A
Repetitive Avalanche Energy (Note 1)	E _{AS}	32		mJ
Operating Temperature Range	T _J	150		°C
Storage Temperature Range	T _{STG}	-55 to +150		°C
Thermal Resistance, Junction to Case	R _{θJC}	1.95	0.54	°C/W
Thermal Resistance, Junction to Ambient	R _{θJA}	62.5	40	°C/W

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	BV_{DSS}	500	-	-	V
Drain-Source Leakage Current	$V_{DS} = 500\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	-	-	1	μA
	$V_{DS} = 400\text{ V}, T_c = 125^\circ\text{C}$		-	-	10	
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	$V_{GS} = 10\text{ V}, I_D = 8\text{ A}$	$R_{DS(on)}$	-	0.33	0.4	Ω
Forward Transconductance	$V_{DS} = 15\text{ V}, I_D = 8\text{ A}$	g_{fs}	-	15	-	S
Input Capacitance	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	C_{iss}	-	1537	-	pF
Output Capacitance		C_{oss}	-	256	-	
Reverse Transfer Capacitance		C_{rss}	-	16	-	
Turn-on Delay Time	$I_D = 20\text{ A}, V_{DD} = 250\text{ V}, R_G = 10\Omega(\text{Note } 3,4)$	$t_{d(ON)}$	-	37	-	nS
Rise Time		t_r	-	70	-	
Turn-Off Delay Time		$t_{d(OFF)}$	-	89	-	
Fall Time		t_f	-	49	-	
Total Gate Charge	$I_D = 20\text{ A}, V_{DD} = 400\text{ V}, V_{GS} = 10\text{ V}(\text{Note } 3,4)$	Q_G	-	48	-	nC
Gate to Source Charge		Q_{GS}	-	13.2	-	
Gate to Drain Charge		Q_{GD}	-	18.7	-	

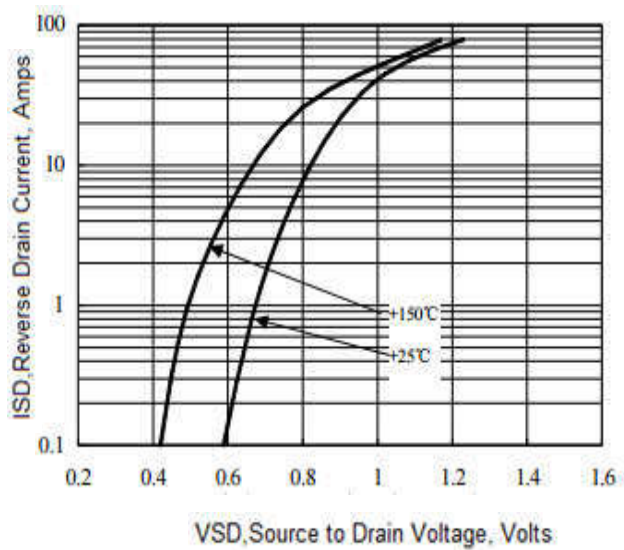
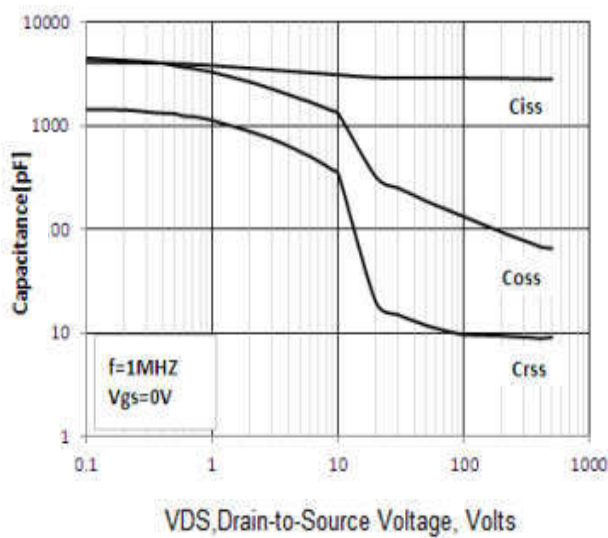
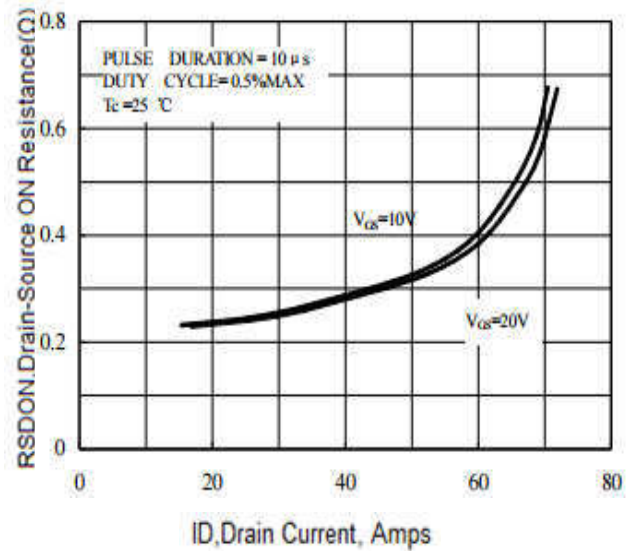
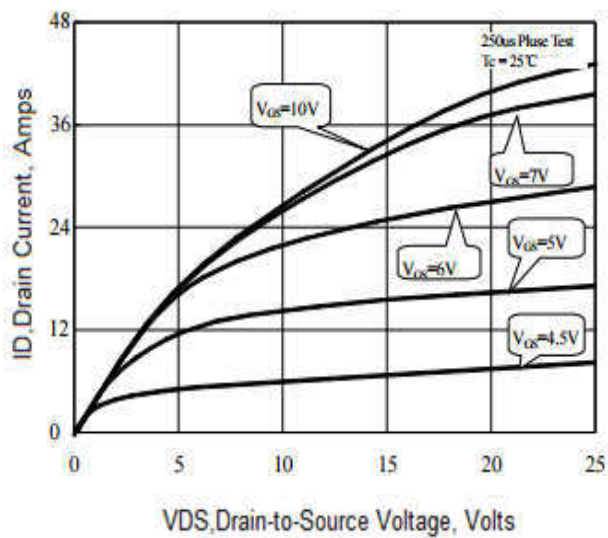
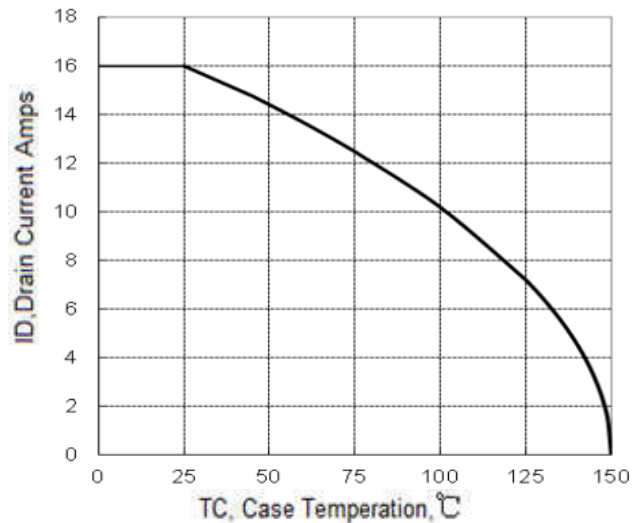
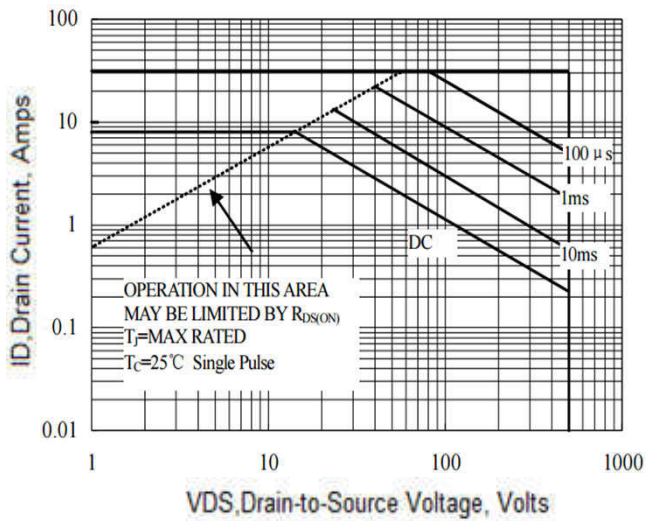
Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Maximun Body-Diode Continuous Current		I_S	-	-	16	A
Maximun Body-Diode Pulsed Current		I_{SM}	-	-	64	A
Drain-Source Diode Forward Voltage	$I_{SD} = 20\text{ A}$	V_{SD}	-	-	1.4	V
Reverse Recovery Time	$I_{SD} = 20\text{ A}, V_{GS} = 0\text{ V}, dI_F / dt = 100\text{ A}/\mu\text{s}(\text{Note } 3)$	t_{rr}	-	382	-	nS
Reverse Recovery Charge		Q_{rr}	-	2.7	-	μC

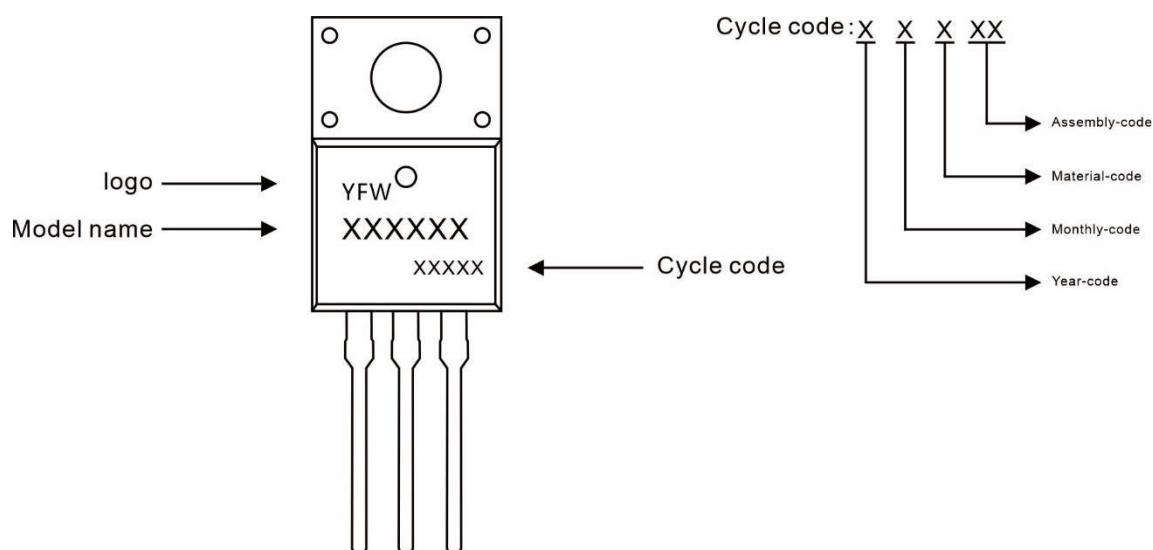
Note:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. $I_{AS} = 16\text{ A}, V_{DD} = 50\text{ V}, L = 8\text{ mH}, R_G = 25\Omega$, starting $T_J = 25^\circ\text{C}$.
3. ulse test: Pulse Width $\leq 300\text{ }\mu\text{s}$, Duty Cycles $\leq 2\%$.
4. Essentially Independent of Operating Temperature.

Ratings and Characteristic Curves



Marking Diagram



Ordering information

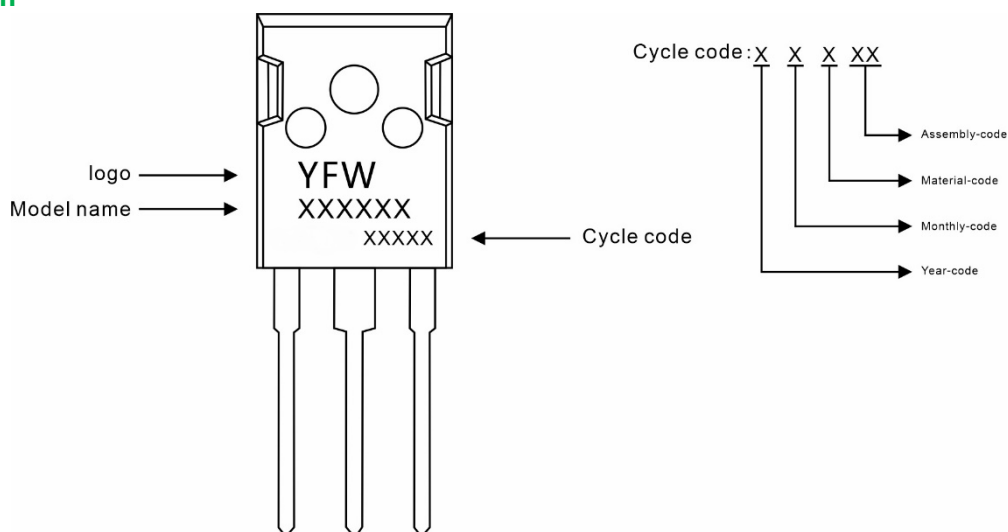
Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW16N50AF	TO-220F	0.06oz(1.74g)	50pcs/tube	1000PCS/Box 5000PCS/Carton

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

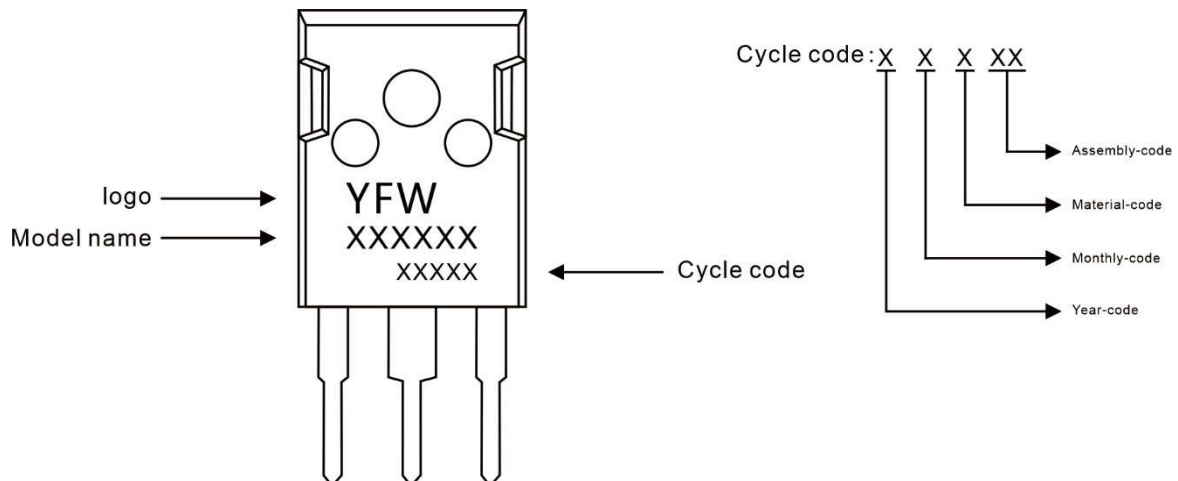
Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW16N50AP	TO-247	0.209oz(5.93g)	30pcs/tube	600PCS/Box 2400PCS/Carton

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

Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW16N50APS	TO-247S	0.158oz(4.48g)	30pcs/tube	600PCS/Box 2400PCS/Carton

Package Dimensions

TO-247S

Symbol	Dimensions in mm		Dimensions in Inch	
	Min.	Max.	Min.	Max.
A	15.0	16.0	0.59	0.63
B	19.5	20.5	0.77	0.81
C	33.5	35.5	1.32	1.40
D	5.0	6.0	0.20	0.24
E	3.5	4.5	0.14	0.18
F	2.5	3.5	0.10	0.14
G	1.75	2.5	0.07	0.14
H	3.0	4.0	0.12	0.16
I	9.0	11.0	0.35	0.43
J	4.9	5.1	0.19	0.20
K	1.0	1.3	0.04	0.05
L	3.75	4.25	0.15	0.17
M	4.75	5.25	0.19	0.21
N	1.8	2.2	0.07	0.09
O	0.45	0.6	0.018	0.024
P	5.08		0.2	
Q	1.2	1.3	0.05	0.051

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