

40V N-CHANNEL ENHANCEMENT MODE MOSFET

MAIN CHARACTERISTICS

I_D	120A
V_{DSS}	40V
R_{DS(on)}-typ(@V_{GS}=10V)	<4.5mΩ(Typ:3.8 mΩ)

Features

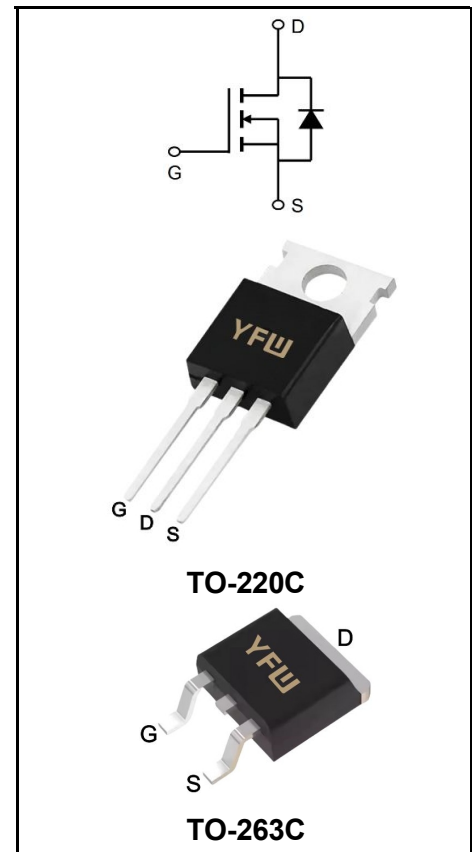
- ◆Advanced Trench Technology
- ◆Lead free and Green Device Available
- ◆Excellent RDS(ON) and Low Gate Charge

Application

- ◆Load Switch
- ◆PWM Appication
- ◆Power Management

MECHANICAL DATA

- ◆Case: TO-220C/AC TO-263C/ASC
- ◆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	Symbols	Value	Units
Drain-Source Voltage	V_{DS}	40	V
Gate - Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	120	A
Pulsed Drain Current(Note1)	I_{DM}	480	A
Total Power Dissipation	P_D	120	W
Single Pulse Avalanche Energy(Note1)	E_{AS}	136	mJ
Operating Junction Temperature Range	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C
Thermal Resistance, Junction-case	R_{θJC}	1.2	°C/W
Thermal Resistance, Junction ambient	R_{θJA}	55	°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}	40	-	-	V
Zero Gate Voltage Drain Current	$V_{DS} = 40V, V_{GS} = 0V$	I_{DSS}	-	-	1	μA
Gate Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	-	-	± 100	nA
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D=250\mu A$	$V_{GS(th)}$	1		2.5	V
Drain-Source on-Resistance (Note 3)	$V_{GS}=10V, I_D=30A$	$R_{DS(on)}$	-	3.8	4.5	m Ω
	$V_{GS} = 4.5V, I_D = 20A$	$R_{DS(on)}$		4.5	5.5	m Ω
Input Capacitance	$V_{DS}=20V$ $V_{GS}=0V$ $f=1MHz$	C_{iss}	-	5125	-	μF
Output Capacitance		C_{oss}	-	370	-	
Reverse Transfer Capacitance		C_{rss}	-	305	-	
Total Gate Charge(Note2)	$V_{DS}=20V$ $V_{GS}=10V$ $I_D=30A$	Q_g	-	65	-	nC
Gate-Source Charge(Note2)		Q_{gs}	-	12.5	-	
Gate-Drain Charge(Note2)		Q_{gd}	-	15	-	
Turn-on delay time(Note2)	$V_{DD}=20V$ $V_{GS}=10V$ $I_D=30A$ $R_L=1\Omega$ $R_{GEN}=3\Omega$	$t_{d(on)}$	-	12	-	ns
Rise Time(Note2)		T_r	-	16	-	
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	39	-	
Fall Time(Note2)		t_f	-	15	-	
Maximun Body-Diode Continuous Current		I_S	-	-	120	A
Drain-Source Diode Forward Voltage	$V_{GS}=0V, I_S=30A, T_J=25^\circ C$	V_{SD}	-	-	1.2	V
Reverse Recovery Time(Note2)	$T_J = 25^\circ C, I_F=20A$ $di / dt = 100 A/\mu s$	t_{rr}	-	22	-	ns
Reverse Recovery Charge(Note2)		Q_{rr}	-	11	-	nC

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

Ratings and Characteristic Curves

Figure1: Output Characteristics

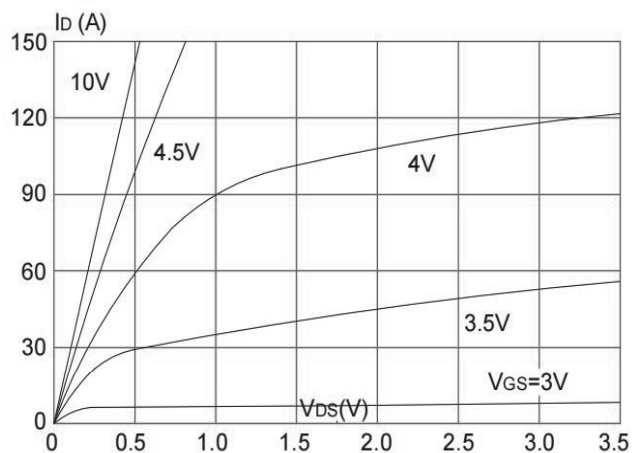


Figure 2: Typical Transfer Characteristics

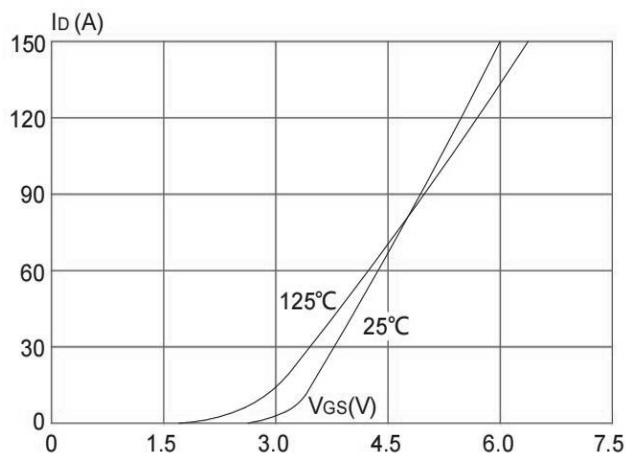


Figure 3: On-resistance vs. Drain Current

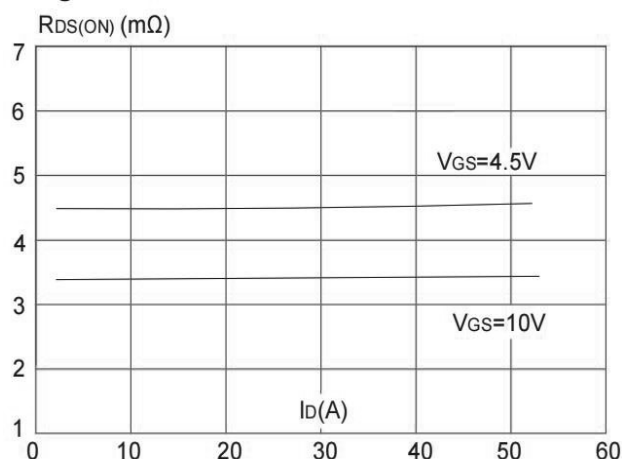


Figure 4: Body Diode Characteristics

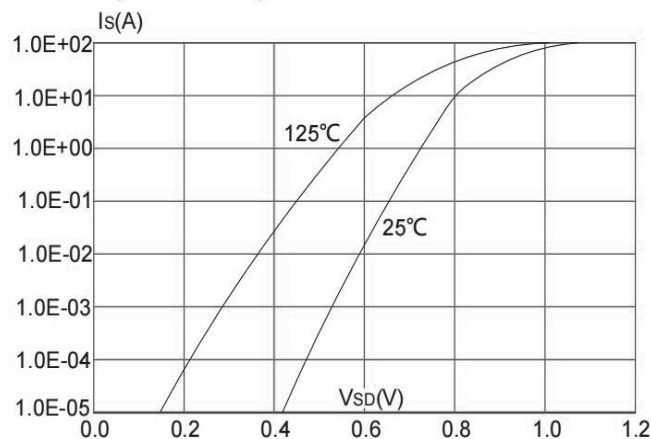


Figure 5: Gate Charge Characteristics

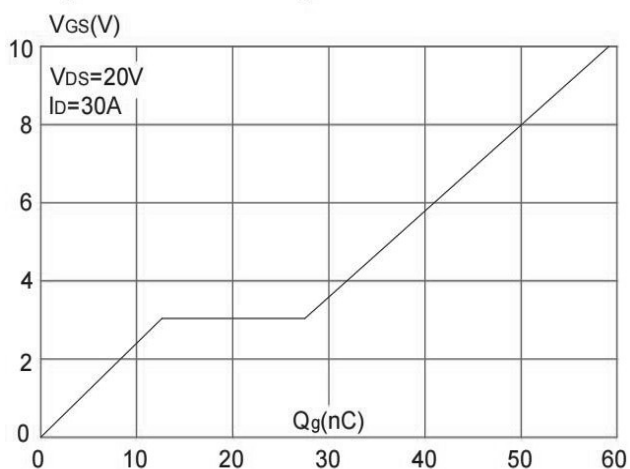
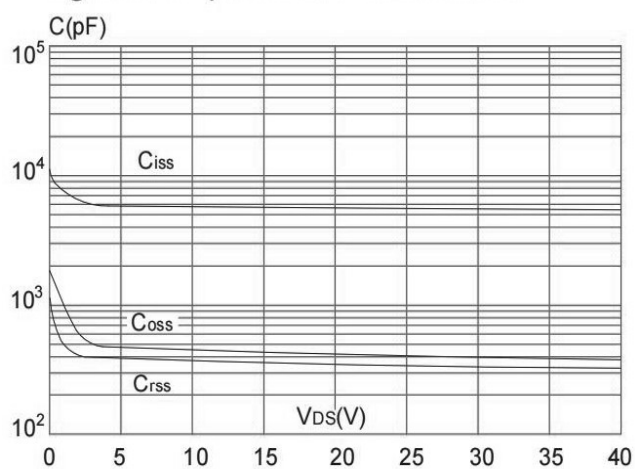


Figure 6: Capacitance Characteristics



Ratings and Characteristic Curves

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

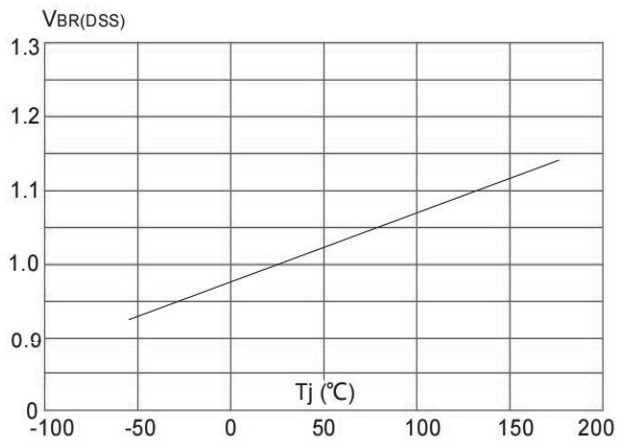


Figure 8: Normalized on Resistance vs. Junction Temperature

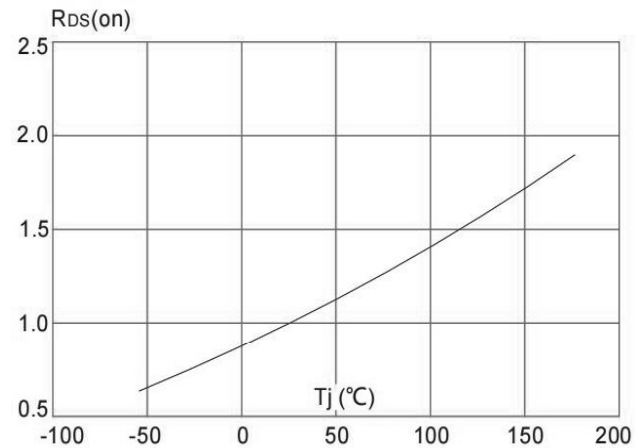


Figure 9: Maximum Safe Operating Area

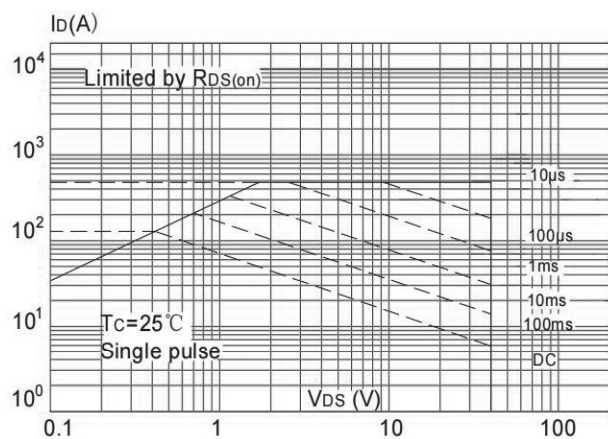


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

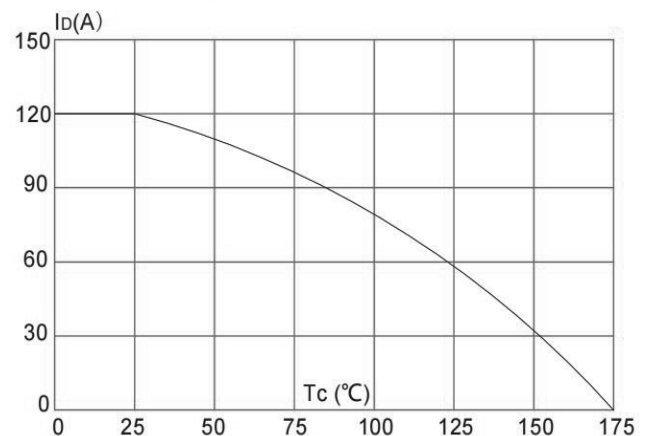
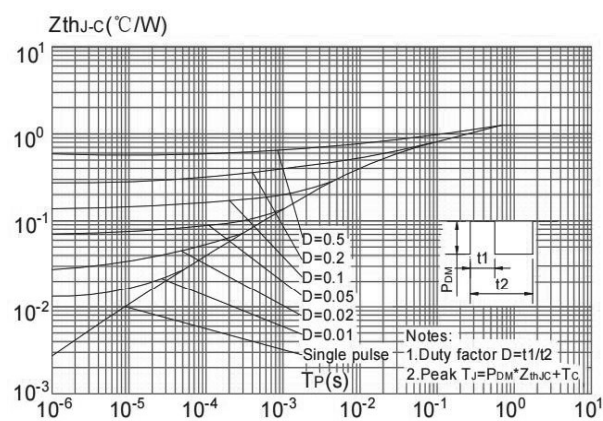
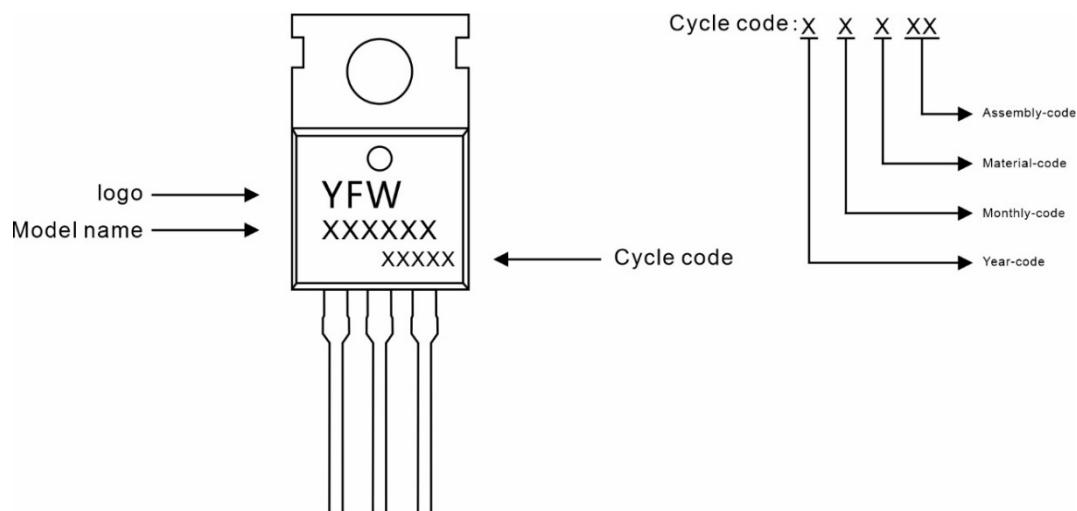


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Marking Diagram



Ordering information

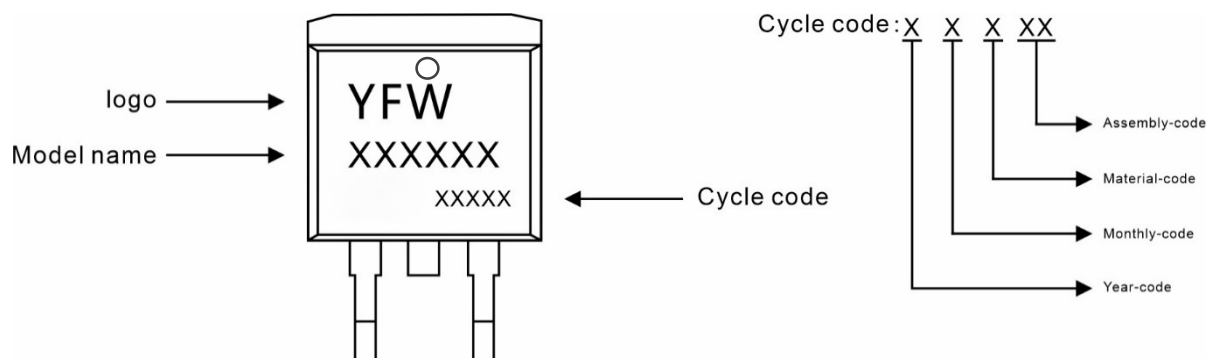
Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW120N04AC	TO-220C	0.07oz(1.96g)	50pcs/tube	1000PCS/Box 5000PCS/Carton

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
YFW120N04ASC	TO-263C	0.04oz(1.16g)	800pcs/reel	1600pcs/box 8000pcs/Carton

Package Dimensions

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

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