

60V N-Channel Enhancement Mode MOSFET

MAIN CHARACTERISTICS

I_D	160A
V_{DS}	60V
R_{DS(on)-typ}(@V_{GS}=10V)	<2.6mΩ(Typ:2.2mΩ)

FEATURES

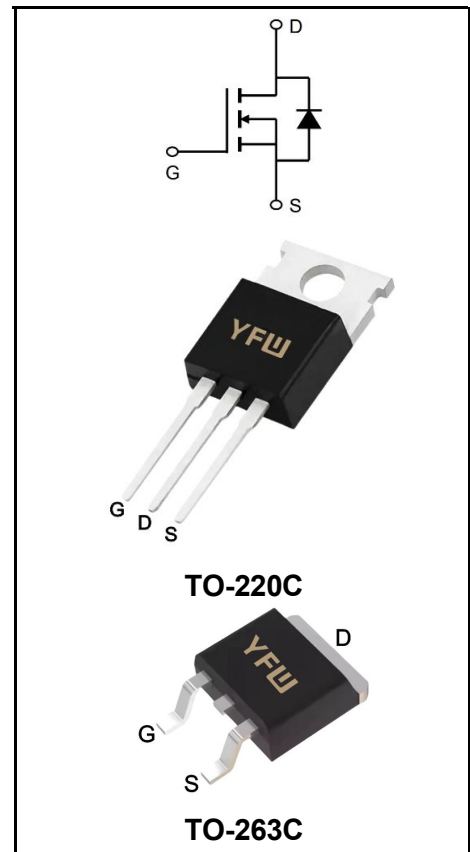
- ◆High ruggedness
- ◆Fast switching
- ◆100% avalanche tested
- ◆Improved dv/dt capability

APPLICATIONS

- ◆PWM Application
- ◆Load Switch
- ◆Power Management
- ◆YFW-SGT technology

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℃ maximum,10s per JESD 22-B106



Maximum Ratings at Tc=25℃ unless otherwise specified

Characteristics	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continue Drain Current	I_D	160	A
Pulsed Drain Current (Note1)	I_{DM}	480	A
Power Dissipation	P_D	320	W
Single Pulse Avalanche Energy (Note1)	E_{AS}	270	mJ
Operating Temperature Range	T_J	150	℃
Storage Temperature Range	T_{STG}	-55 to +150	℃
Thermal Resistance, Junction to Case	R_{θJC}	0.39	℃/W
Thermal Resistance, Junction to Ambient	R_{θJA}	62.5	℃/W

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

Electrical Characteristics at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	BV_{DSS}	60	-	-	V
Drain-Source Leakage Current	$V_{DS} = 60\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	-	-	1	μA
Gate Leakage Current	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	$V_{GS(th)}$	1.1	-	2.1	V
Drain-Source On-State Resistance	$V_{GS} = 10\text{ V}, I_D = 30\text{ A}$	$R_{DS(on)}$	-	2.2	2.6	m Ω
	$V_{GS} = 4.5\text{ V}, I_D = 20\text{ A}$		-	2.6	3.4	m Ω
Input Capacitance	$V_{GS} = 0\text{ V}$ $V_{DS} = 25\text{ V}$ $f = 500\text{ KHz}$	C_{iss}	-	5460	-	pF
Output Capacitance		C_{oss}	-	1290	-	pF
Reverse Transfer Capacitance		C_{rss}	-	13	-	pF
Turn-on Delay Time	$V_{DS}=30\text{ V}$ $I_D=60\text{ A}$ $V_{GS}=10\text{ V}$ $R_G=4.7\Omega$	$t_{d(ON)}$	-	20	-	ns
Rise Time		t_r	-	127	-	ns
Turn-Off Delay Time		$t_{d(OFF)}$	-	95	-	ns
Fall Time		t_f	-	25	-	ns
Total Gate Charge	$V_{DS}=30\text{ V}$ $I_D=30\text{ A}$ $V_{GS}=10\text{ V}$	Q_G	-	86	-	nC
Gate to Source Charge		Q_{GS}	-	14	-	nC
Gate to Drain Charge		Q_{GD}	-	14	-	nC
Maximun Body-Diode Continuous Current		I_S	-	-	160	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	480	A
Drain-Source Diode Forward Voltage	$V_{GS}=0\text{ V}, I_S=30\text{ A}, T_J=25^\circ\text{C}$	V_{SD}	-	-	1.4	V
Reverse Recovery Time(Note2)	$I_S = I_F, I_{SD}=30\text{ A}, V_{GS} = 0\text{ V},$ $dI / dt = 100\text{ A}/\mu\text{s}$ (Note3)	t_{rr}	-	63	-	ns
Reverse Recovery Charge(Note2)		Q_{rr}	-	59	-	nC

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

RATINGS AND CHARACTERISTIC CURVES

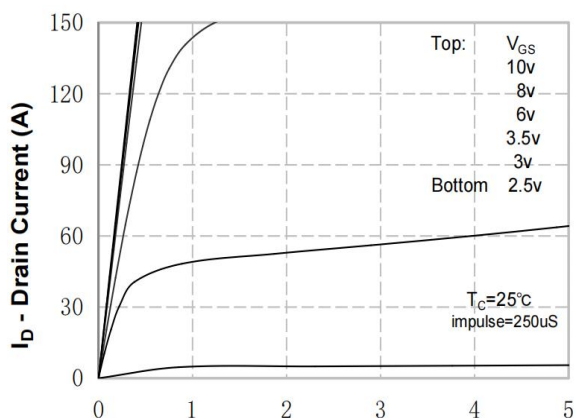


Figure 1. On-Region Characteristics

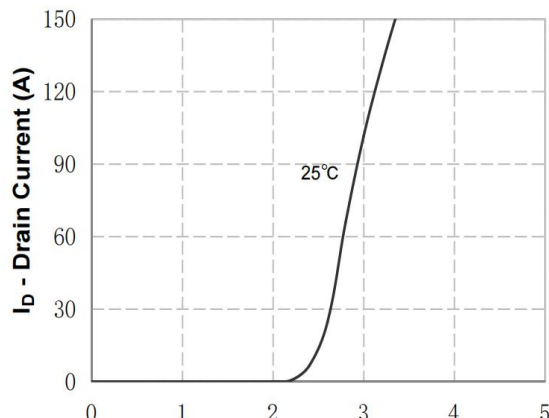


Figure 2. Transfer Characteristics

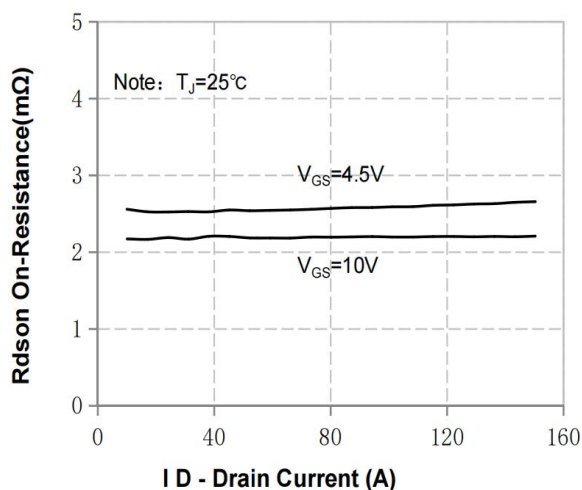


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

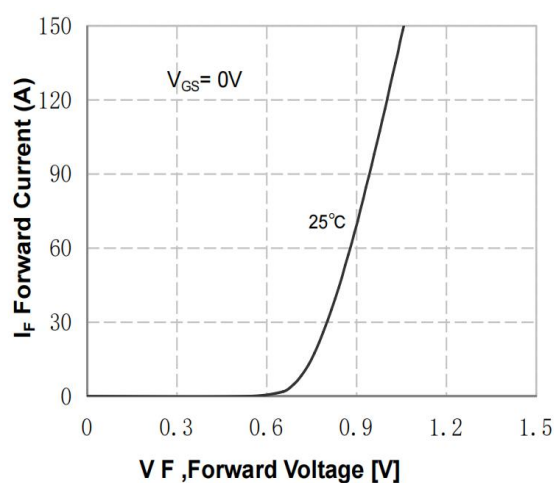


Figure 4. Body Diode Forward Voltage Variation with Source Current

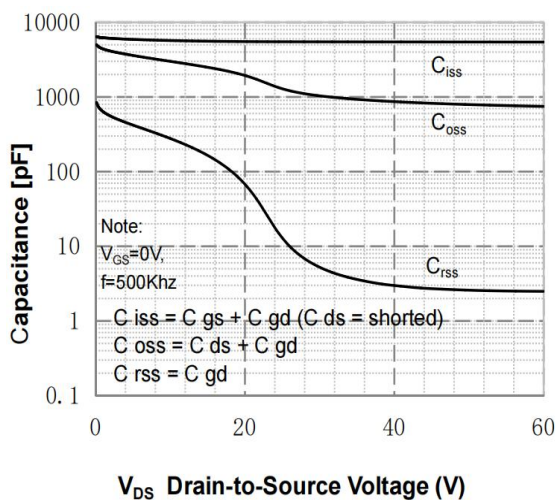


Figure 5. Capacitance Characteristics

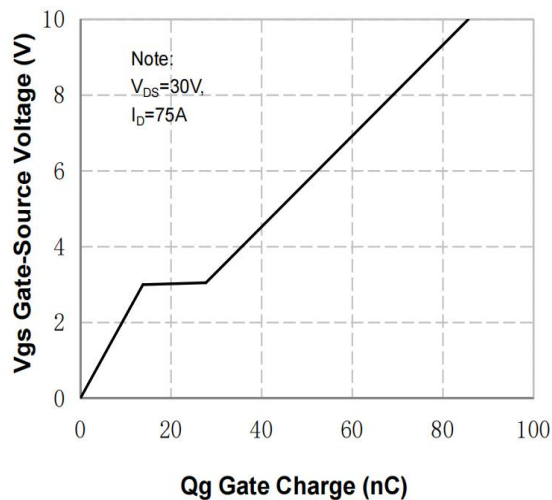


Figure 6. Gate Charge Characteristics

RATINGS AND CHARACTERISTIC CURVES

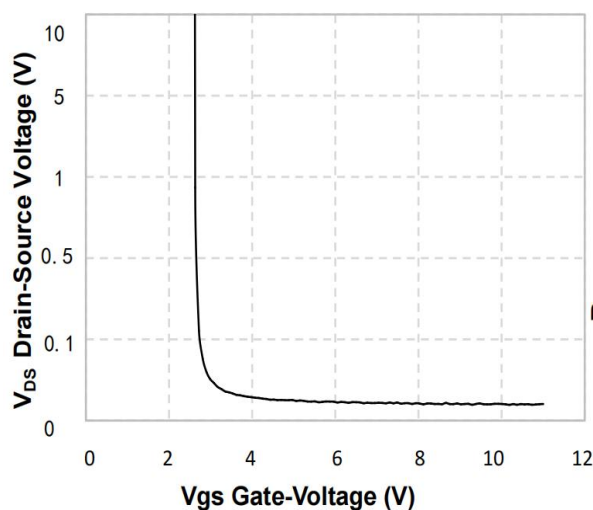


Figure 7. V_{DS} Drain-Source Voltage vs Gate Voltage

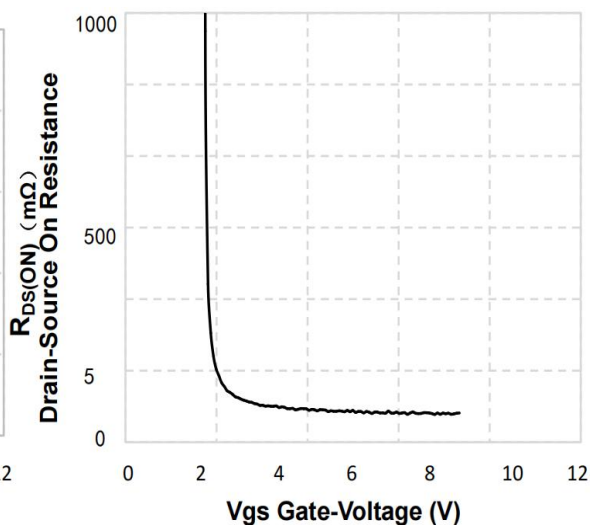


Figure 8. On-Resistance vs Gate Voltage

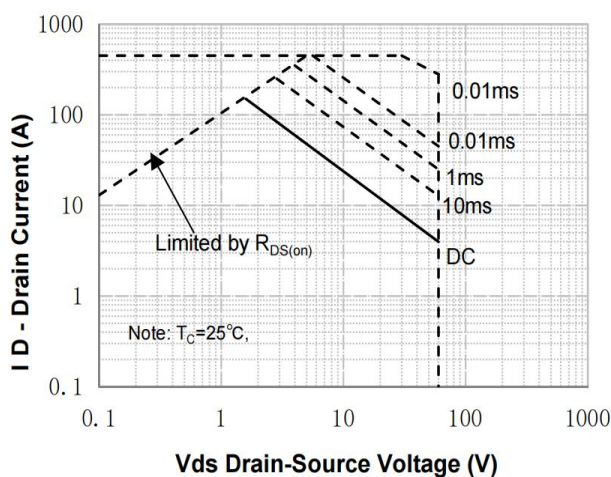


Figure 9. Maximum Safe Operating Area

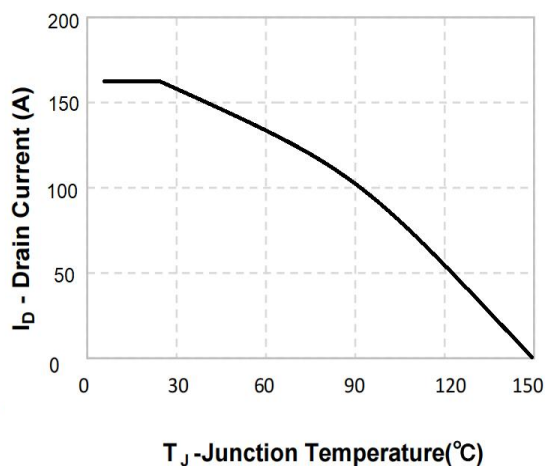


Figure 10. Maximum Continuous Drain Current vs Temperature

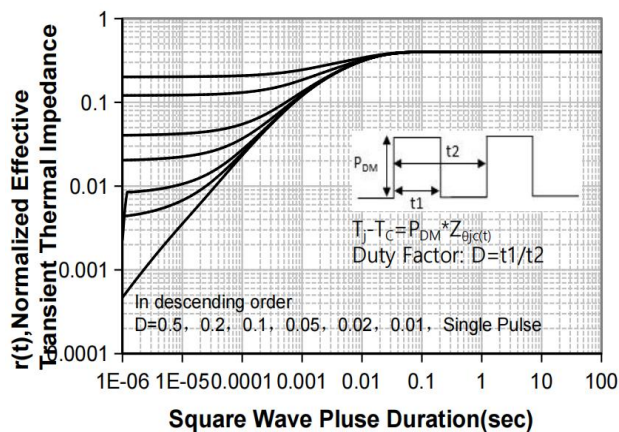
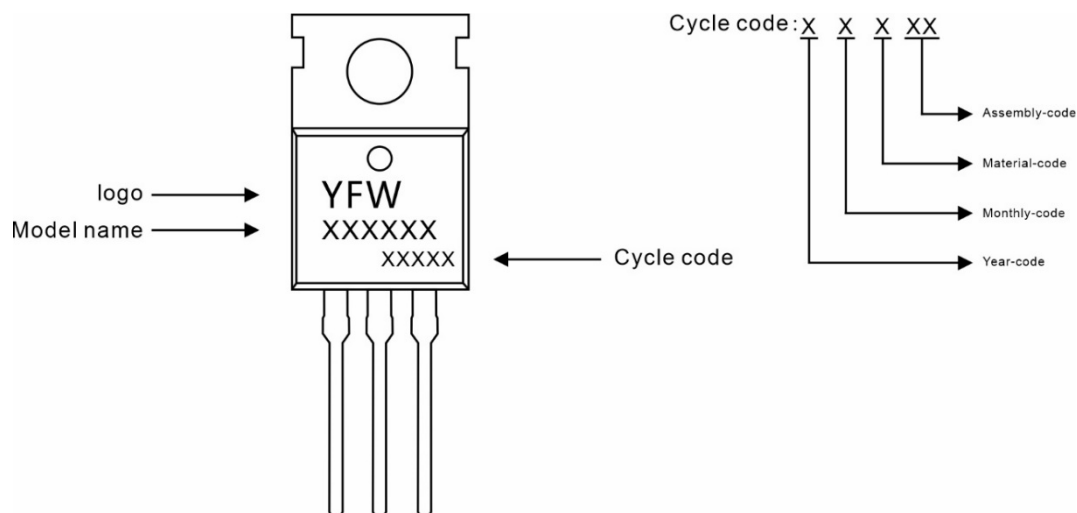


Figure 11. Transient Thermal Response Curve

Marking Diagram



Ordering information

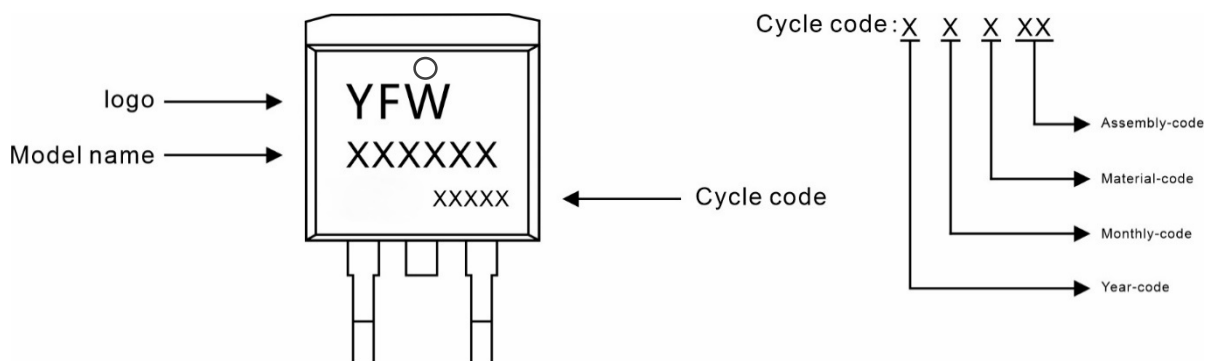
Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFWG160N06AC	TO-220C	0.07oz(1.96g)	50pcs/tube	1000PCS/Box 5000PCS/Carton

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
YFWG160N06ASC	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

Disclaimer

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