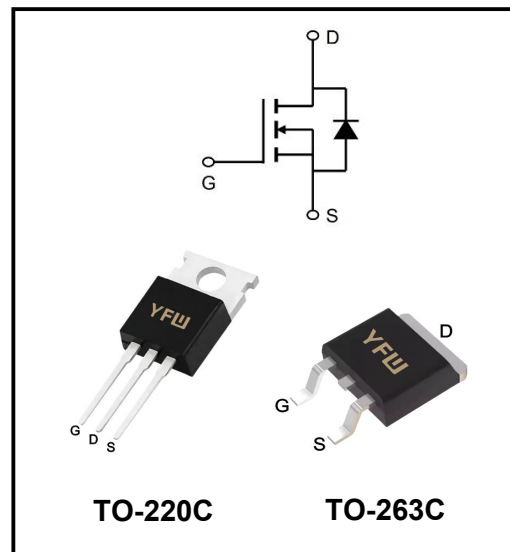


**60V N- Channel Advanced Power MOSFET**

**MAIN CHARACTERISTICS**

|                                                    |                   |
|----------------------------------------------------|-------------------|
| <b>I<sub>D</sub></b>                               | 120A              |
| <b>V<sub>DSS</sub></b>                             | 60V               |
| <b>R<sub>DS(on)</sub>-typ(@V<sub>GS</sub>=10V)</b> | <4.4mΩ(Typ:3.5mΩ) |



**FEATURES**

- ♦Advanced Trench Technology
- ♦Excellent RDS(ON) and Low Gate Charge

**Application**

- ♦Load Switch
- ♦PWM Application
- ♦Power Management

**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 Tc=25°C unless otherwise specified**

| Characteristics                         | Symbols                | Value       | Units       |
|-----------------------------------------|------------------------|-------------|-------------|
| Drain-Source Voltage                    | <b>V<sub>DS</sub></b>  | 60          | <b>V</b>    |
| Gate - Source Voltage                   | <b>V<sub>GS</sub></b>  | ±20         | <b>V</b>    |
| Continuous drain current                | <b>I<sub>D</sub></b>   | 120         | <b>A</b>    |
| Pulsed Drain Current (Note1)            | <b>I<sub>DM</sub></b>  | 480         | <b>A</b>    |
| Power dissipation                       | <b>P<sub>D</sub></b>   | 96          | <b>W</b>    |
| Single Pulse Avalanche Energy           | <b>E<sub>AS</sub></b>  | 290         | <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-case       | <b>R<sub>θJC</sub></b> | 1.3         | <b>°C/W</b> |
| Thermal Resistance, Junction to Ambient | <b>R<sub>θJA</sub></b> | 62          | <b>°C/W</b> |

**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                 | $V_{GS}=0V, I_D=250\mu A$                                              | $BV_{DSS}$   | 60  | -    | -         | V          |
| Drain-Source Leakage Current                   | $V_{DS}=60V, V_{GS}=0V$                                                | $I_{DSS}$    | -   | -    | 1         | $\mu A$    |
| Gate-Source Leakage Current                    | $V_{DS} = \pm 20V, V_{GS} = 0V$                                        | $I_{GSS}$    | -   | -    | $\pm 100$ | nA         |
| Gate -Threshold Voltage                        | $V_{DS}=V_{GS}, I_D=250\mu A$                                          | $V_{GS(th)}$ | 2.0 | -    | 4         | V          |
| Drain-Source On-State Resistance               | $V_{GS} = 10V, I_D = 30A$                                              | $R_{DS(ON)}$ | -   | 3.5  | 4.4       | m $\Omega$ |
|                                                | $V_{GS} = 8V, I_D=30A$                                                 |              | -   | 4.2  | 5.3       | m $\Omega$ |
| Input Capacitance                              | $V_{GS}=0V$<br>$V_{DS}=30V$<br>$f=1MHz$                                | $C_{iss}$    | -   | 5040 | -         | pF         |
| Output Capacitance                             |                                                                        | $C_{oss}$    | -   | 405  | -         |            |
| Reverse Transfer Capacitance                   |                                                                        | $C_{rss}$    | -   | 365  | -         |            |
| Turn-on delay time                             | $V_{DS}=30V$<br>$V_{GS}=10V$<br>$R_G=1.8\Omega$<br>$I_D=30A$           | $t_{d(on)}$  | -   | 12   | -         | ns         |
| Rise Time                                      |                                                                        | $T_r$        | -   | 8    | -         |            |
| Turn-Off Delay Time                            |                                                                        | $t_{d(OFF)}$ | -   | 50   | -         |            |
| Fall Time                                      |                                                                        | $t_f$        | -   | 15   | -         |            |
| Total Gate Charge                              | $V_{DS}=30V$<br>$V_{GS}=10V$<br>$I_D=30A$                              | $Q_g$        | -   | 105  | -         | nC         |
| Gate-Source Charge                             |                                                                        | $Q_{gs}$     | -   | 15   | -         |            |
| Gate-Drain Charge                              |                                                                        | $Q_{gd}$     | -   | 32   | -         |            |
| Maximun Body-Diode Continuous Current (Note 2) |                                                                        | $I_S$        | -   | -    | 120       | A          |
| Maximun Body-Diode Pulsed Current              |                                                                        | $I_{SM}$     | -   | -    | 480       | A          |
| Drain-Source Diode Forward Voltage             | $I_{SD} = 30A$                                                         | $V_{SD}$     | -   | -    | 1.2       | V          |
| Reverse Recovery Time                          | $I_S = I_F$<br>$I_{SD}=30A$<br>$V_{GS} = 0V$<br>$di / dt = 500A/\mu s$ | $t_{rr}$     | -   | 28   | -         | ns         |
| Reverse Recovery Charge                        |                                                                        | $Q_{rr}$     | -   | 48   | -         | nC         |

**Note2:Pulse test: 300  $\mu s$  pulse width, 2 % duty cycle**

Ratings and Characteristic Curves

Figure 1: Output Characteristics

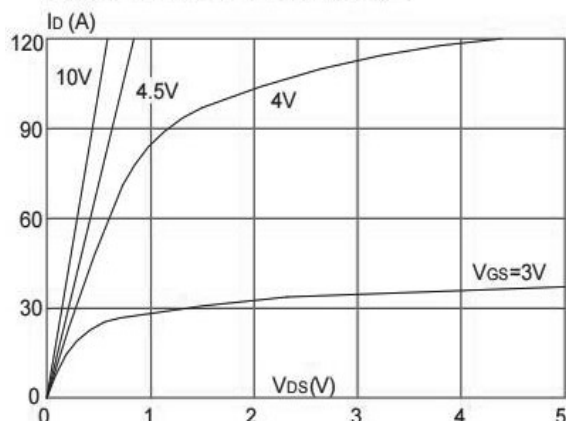


Figure 2: Typical Transfer Characteristics

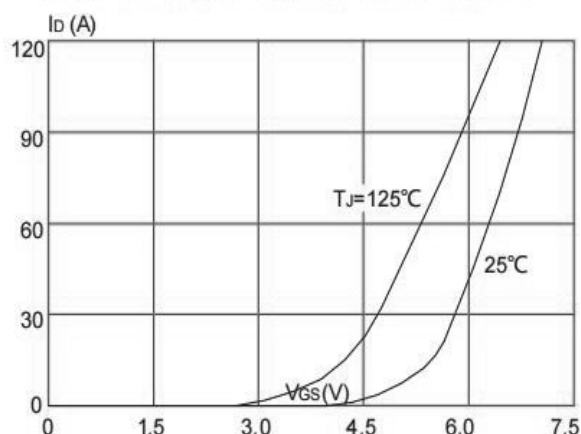


Figure 3: On-resistance vs. Drain Current

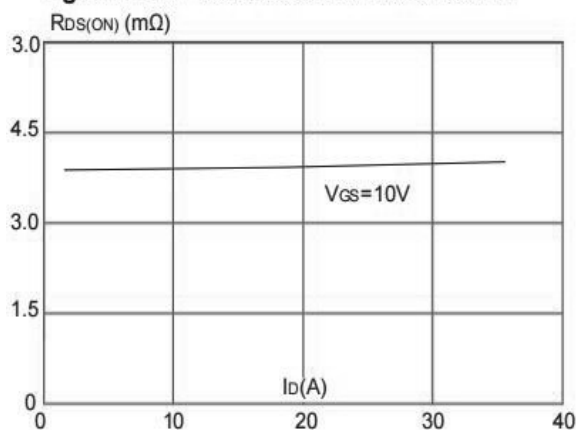


Figure 4: Body Diode Characteristics

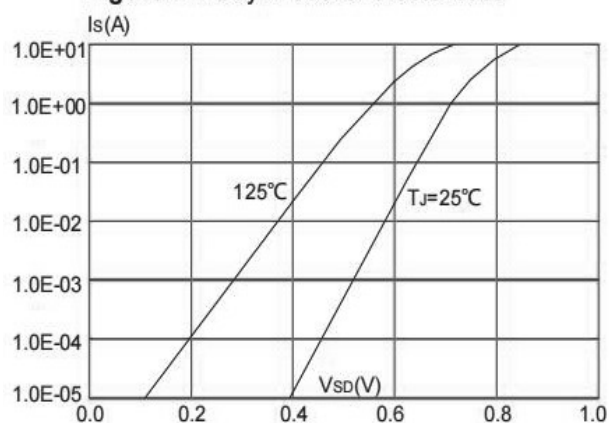


Figure 5: Gate Charge Characteristics

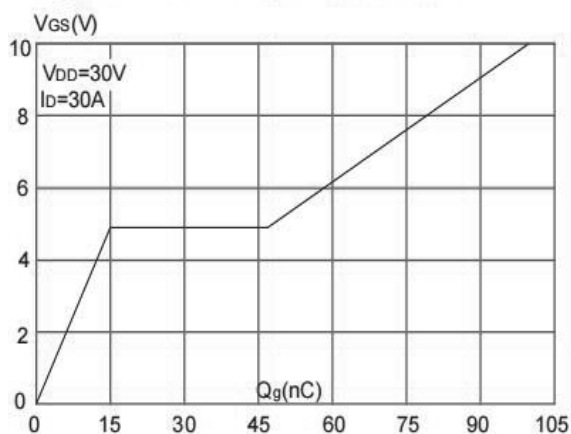
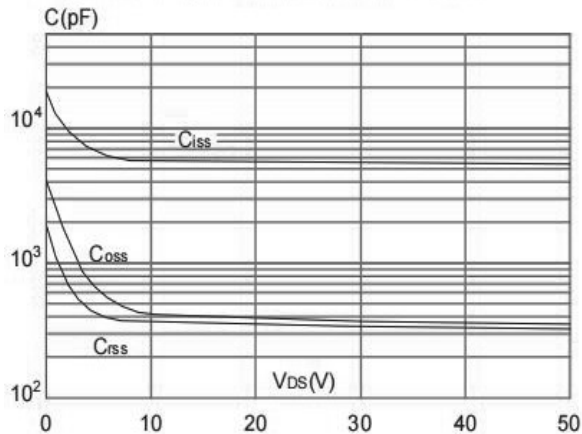
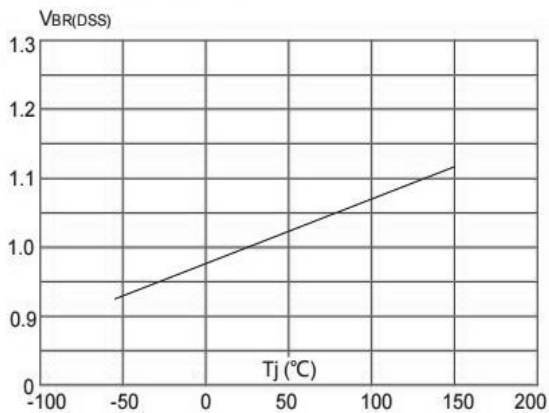


Figure 6: Capacitance Characteristics

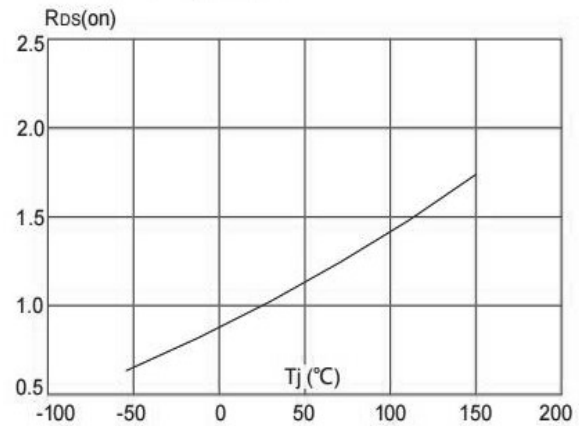


**RATINGS AND CHARACTERISTIC CURVES**

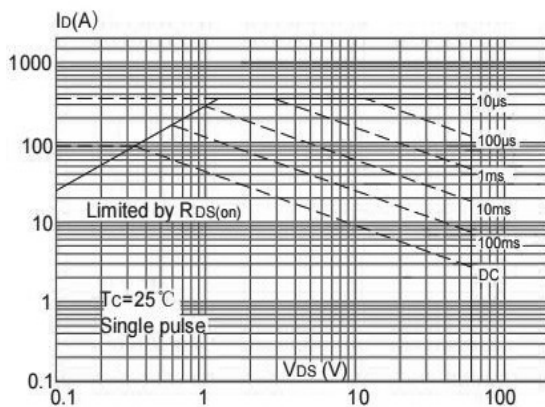
**Figure 7: Normalized Breakdown Voltage vs. Junction Temperature**



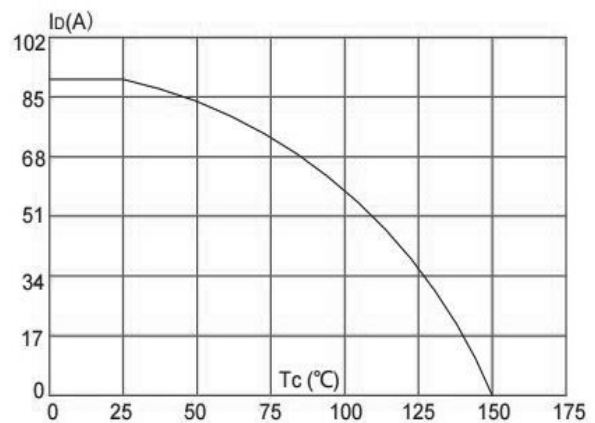
**Figure 8: Normalized on Resistance vs. Junction Temperature**



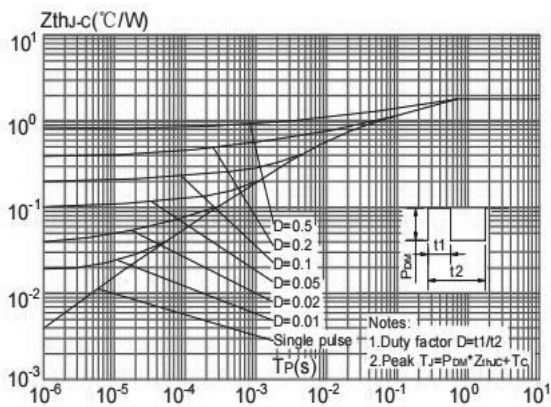
**Figure 9: Maximum Safe Operating Area**



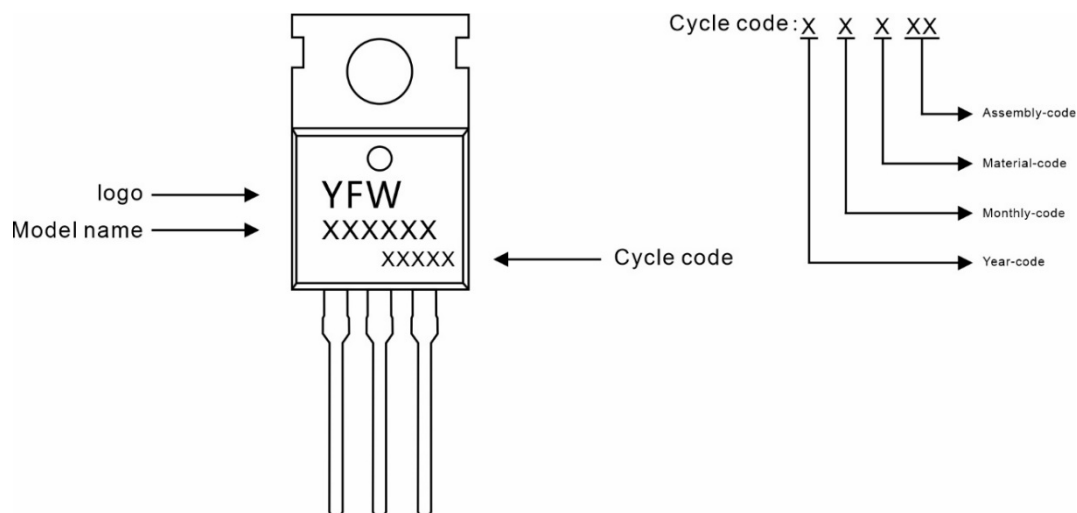
**Figure 10: Maximum Continuous Drain Current vs. Case Temperature**



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



## Marking Diagram



## Ordering information

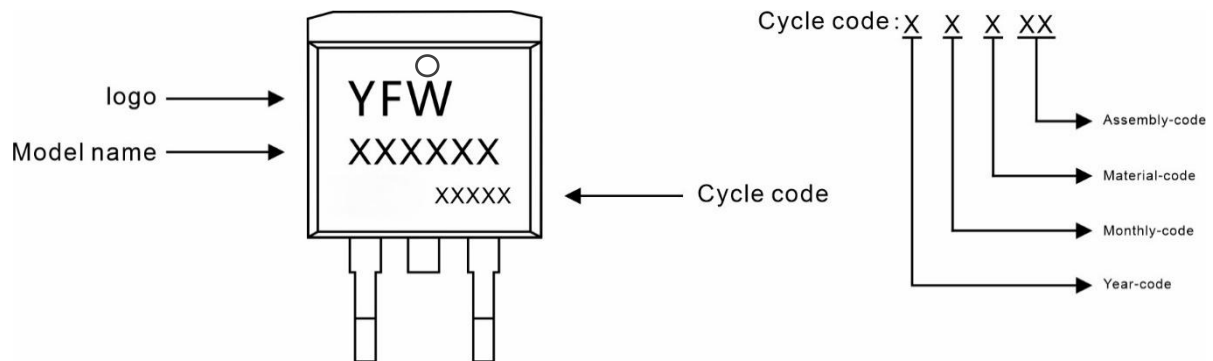
| Model name  | Package | Unit Weight   | Base Quantity | Packing Quantity           |
|-------------|---------|---------------|---------------|----------------------------|
| YFW120N06AC | TO-220C | 0.07oz(1.96g) | 50pcs/tube    | 1000PCS/Box 5000PCS/Carton |

## 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           |
|--------------|---------|---------------|---------------|----------------------------|
| YFW120N06ASC | 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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