

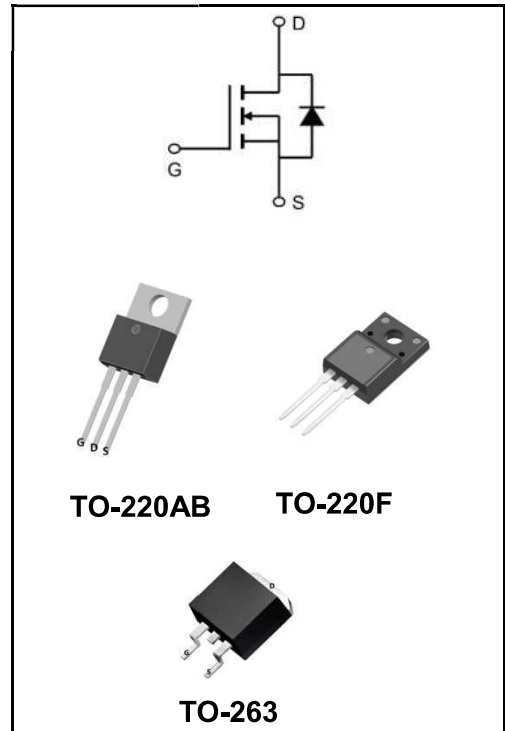
**85V N-CHANNEL ENHANCEMENT MODE MOSFET**

**MAIN CHARACTERISTICS**

|  |                                |
|--|--------------------------------|
| <b>I<sub>D</sub></b>                               | 180A                           |
| <b>V<sub>DSS</sub></b>                             | 85V                            |
| <b>R<sub>DS(on)-typ(@V<sub>GS</sub>=10V)</sub></b> | < 3.5mΩ ( <b>Type:2.9 mΩ</b> ) |

**Application**

- ◆ Battery protection
- ◆ Load switch
- ◆ Uninterruptible power supply



**Product Specification Classification**

| Part Number | Package  | Marking            | Pack        |
|-------------|----------|--------------------|-------------|
| YFW180N08AT | TO-220AB | YFW 180N08AT XXXXX | 1000PCS/box |
| YFW180N08AF | TO-220F  | YFW 180N08AF XXXXX | 1000PCS/box |
| YFW180N08AS | TO-263   | YFW 180N08AS XXXXX | 800PCS/Reel |

**Maximum Ratings at T<sub>c</sub>=25°C unless otherwise specified**

| Characteristics  | Symbols                | Value       | Units       |
|--|------------------------|-------------|-------------|
| Drain-Source Voltage   | <b>V<sub>DS</sub></b>  | 85          | <b>V</b>    |
| Gate-Source Voltage  | <b>V<sub>GS</sub></b>  | ±20         | <b>V</b>    |
| Continuous Drain Current, V <sub>GS</sub> @ 10V @T <sub>c</sub> =25°C  | <b>I<sub>D</sub></b>   | 180         | <b>A</b>    |
| Continuous Drain Current, V <sub>GS</sub> @ 10V @T <sub>c</sub> =100°C | <b>I<sub>D</sub></b>   | 100         | <b>A</b>    |
| Pulsed Drain Current   | <b>I<sub>DM</sub></b>  | 480         | <b>A</b>    |
| Single Pulse Avalanche Energy  | <b>E<sub>AS</sub></b>  | 1558        | <b>mJ</b>   |
| Total Power Dissipation <sup>4</sup> @TC=25°C                          | <b>P<sub>D</sub></b>   | 284         | <b>W</b>    |
| Storage Temperature Range  | <b>T<sub>STG</sub></b> | -55 to +150 | <b>°C</b>   |
| Operating Junction Temperature Range                                   | <b>T<sub>J</sub></b>   | -55 to +150 | <b>°C</b>   |
| Thermal Resistance Junction-Ambient                                    | <b>R<sub>θJA</sub></b> | 0.53        | <b>°C/W</b> |
| Thermal Resistance Junction-Case                                       | <b>R<sub>θJC</sub></b> | 48          | <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     | $V_{GS}=0V, I_D=250\mu A$   | <b>V(BR)DSS</b>           | 85  | 92   | -   | <b>V</b>  |
| Gate -Threshold Voltage            | $V_{DS}=V_{GS}, I_D=250\mu A, T_J=25^\circ C$                     | <b>V<sub>GS(th)</sub></b> | 2.0 | 3.0  | 4.0 | <b>V</b>  |
| Zero gate voltage drain current    | $V_{DS}=80V, V_{GS}=0V, T_J=25^\circ C$                           | <b>I<sub>DSS</sub></b>    | -   | -    | 1   | <b>μA</b> |
|                                    | $V_{DS}=80V, V_{GS}=0V, T_J=125^\circ C$                          |                           | -   | -5   | -   |           |
| Gate- Source Leakage current       | $V_{GS}=\pm 20V, V_{DS}=0V$                                       | <b>I<sub>GSS</sub></b>    | -   | -    | 100 | <b>nA</b> |
| Drain-source on-state resistance   | $V_{GS}=10V, I_D=50A, T_J=25^\circ C$                             | <b>R<sub>DS(ON)</sub></b> | -   | 2.9  | 3.5 | <b>mΩ</b> |
| Transconductance                   | $V_{DS}=5V, I_D=40A$  | <b>g<sub>fs</sub></b>     | -   | 106  | -   | <b>S</b>  |
| Input Capacitance                  | $V_{GS}=0V$<br>$V_{DS}=40V$<br>$f=1MHz$                           | <b>C<sub>iss</sub></b>    | -   | 6813 | -   | <b>pF</b> |
| Output Capacitance                 |   | <b>C<sub>oss</sub></b>    | -   | 808  | -   |           |
| Reverse Transfer Capacitance       |   | <b>C<sub>rss</sub></b>    | -   | 48   | -   |           |
| Gate Total Charge                  | $V_{GS}=10V$<br>$V_{DS}=40V$<br>$I_D=25A$                         | <b>Q<sub>g</sub></b>      | -   | 91   | -   | <b>nC</b> |
| Gate-Source Charge                 |   | <b>Q<sub>gs</sub></b>     | -   | 37   | -   |           |
| Gate-Drain Charge                  |   | <b>Q<sub>gd</sub></b>     | -   | 25   | -   |           |
| Turn-on delay time                 | $T_J=25^\circ C$<br>$V_{GS}=10V$<br>$V_{DS}=40V$<br>$R_L=3\Omega$ | <b>t<sub>d(on)</sub></b>  | -   | 38   | -   | <b>ns</b> |
| Rise Time                          |   | <b>T<sub>r</sub></b>      | -   | 58   | -   |           |
| Turn-Off Delay Time                |   | <b>t<sub>d(OFF)</sub></b> | -   | 63   | -   |           |
| Fall Time                          |   | <b>t<sub>f</sub></b>      | -   | 32   | -   |           |
| Gate resistance                    | $V_{GS}=0V, V_{DS}=0V, f=1MHz$                                    | <b>R<sub>G</sub></b>      | -   | 2    | -   | <b>Ω</b>  |
| Body Diode Forward Voltage         | $I_{SD}=50A, V_{GS}=0V$   | <b>V<sub>SD</sub></b>     | -   | 0.85 | 1.2 | <b>V</b>  |
| Body Diode Reverse Recovery Time   | $I_F=20A, di/dt=500A/\mu s$                                       | <b>t<sub>rr</sub></b>     | -   | 85   | -   | <b>ns</b> |
| Body Diode Reverse Recovery Charge |   | <b>Q<sub>rr</sub></b>     | -   | 313  | -   | <b>nC</b> |

Note :

- 1、 The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
- 2、 The data tested by pulsed , pulse width .The EAS data shows Max. rating .
- 3、 The test cond  $\cong$  300us duty cycle  $\cong$  2%, duty cycle ition is  $V_{DD}=64V, V_{GS}=10V, L=0.1mH, I_{AS}=53.8A$
- 4、 The power dissipation is limited by 175°C junction temperature
- 5、 The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

**Ratings and Characteristic Curves**

**Typical Characteristics**

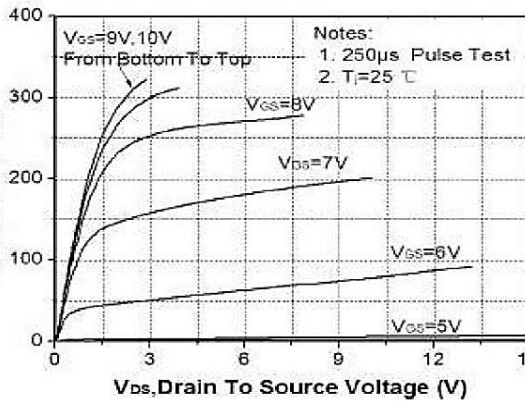


Figure 1. Typ. Output Characteristics (Tj=25 °C)

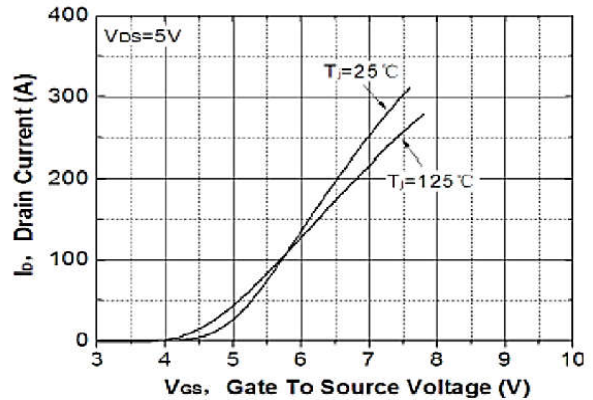


Figure 2. Transfer Characteristics

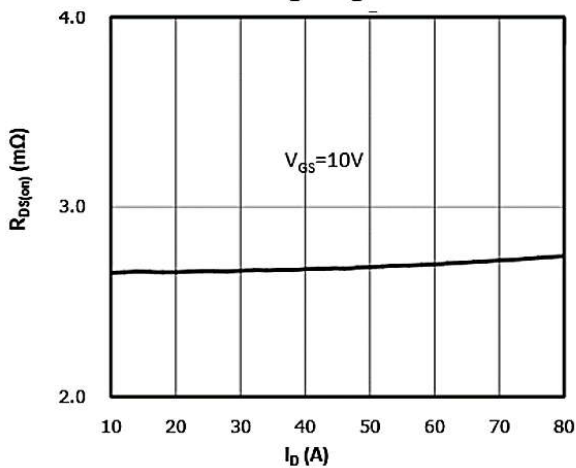


Figure 3. On-Resistance vs. Drain Current and Gate Voltage Figure

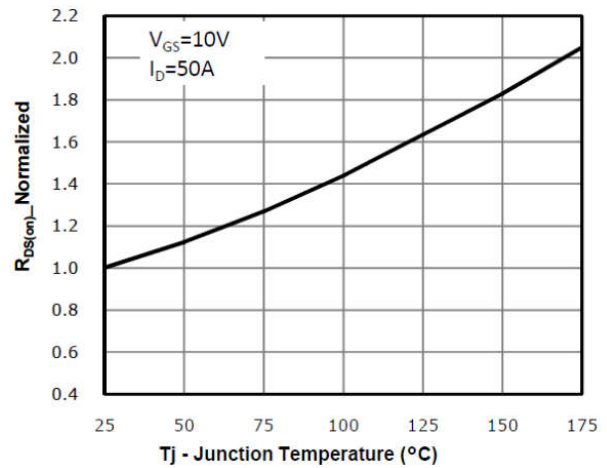


Figure 4. On-Resistance vs. Junction Temperature

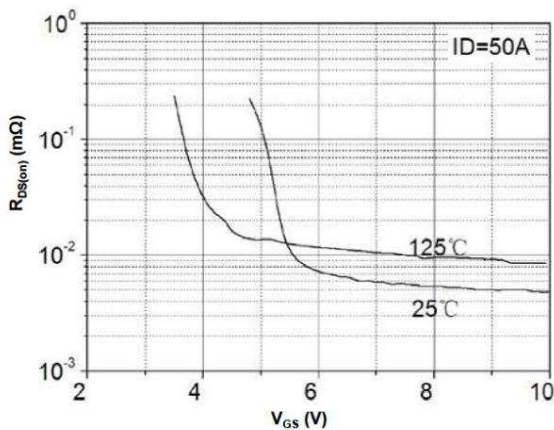


Figure 5. On-Resistance vs. Gate-Source Voltage

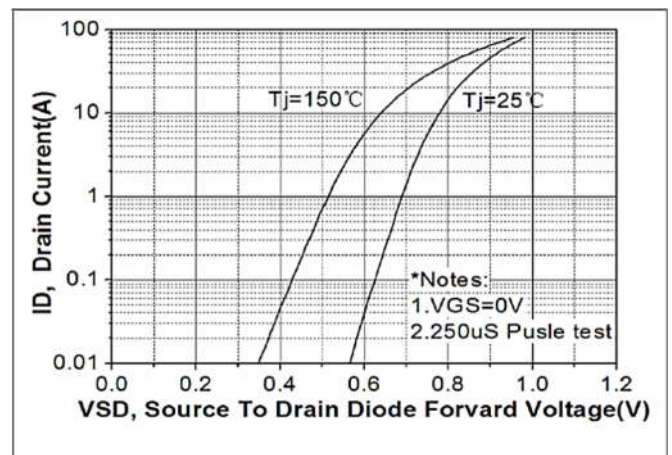


Figure 6. Body-Diode Characteristics

Ratings and Characteristic Curves

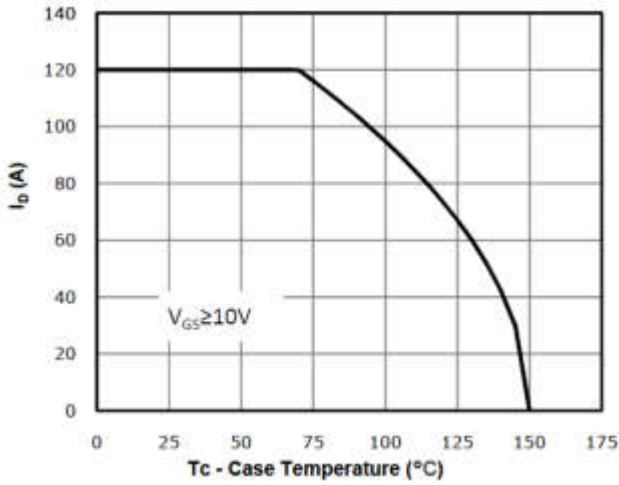


Figure 7. Gate-Charge Characteristics

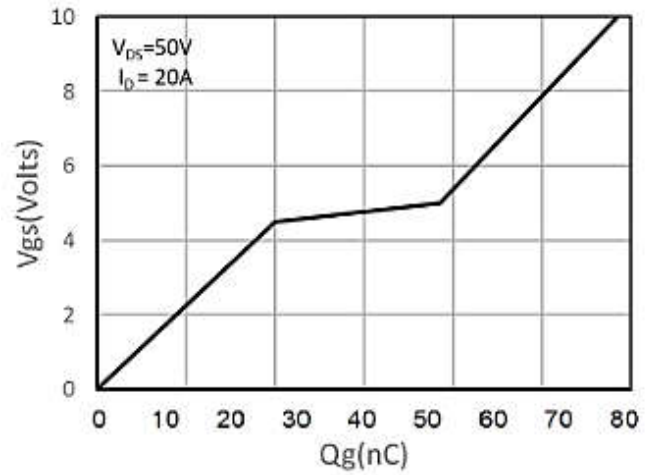


Figure 8. Drain Current Derating

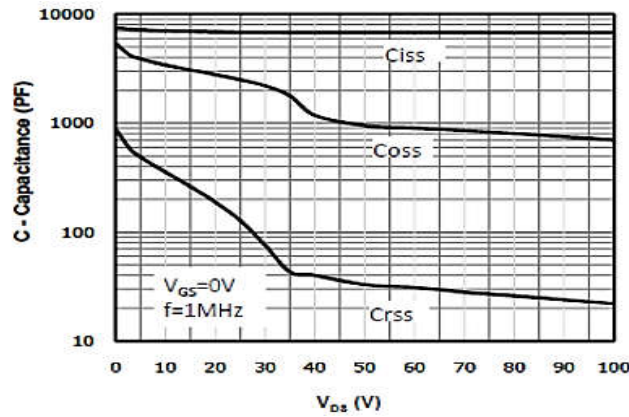


Figure 9: Normalized Maximum Transient Thermal Impedance

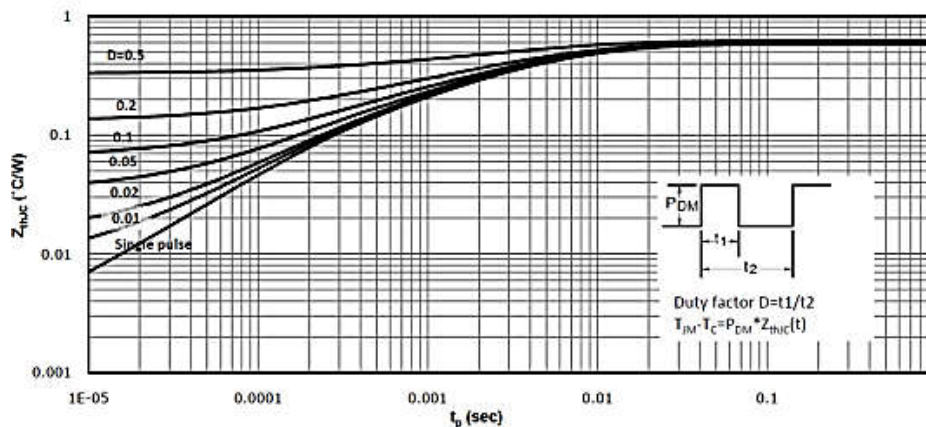


Figure 10. Capacitance Characteristics

Package Outline Dimensions Millimeters

TO-220AB

|                              |      |          |       |
|------------------------------|------|----------|-------|
|                              | Dim. | Min.     | Max.  |
|                              | A    | 10.15    | 10.35 |
|                              | B    | 2.65     | 2.95  |
|                              | C    | 3.70     | 3.90  |
|                              | D    | 28.5     | 29.5  |
|                              | E    | 1.30     | 1.45  |
|                              | F    | 6.35     | 6.55  |
|                              | G    | 2.9      | 3.3   |
|                              | H    | 15.0     | 16.0  |
|                              | I    | 0.38     | 0.42  |
|                              | J    | 4.45     | 4.55  |
|                              | K    | 1.25     | 1.35  |
|                              | L    | Typ 5.08 |       |
|                              | M    | Typ 2.54 |       |
|                              | N    | 3.1      | 3.3   |
| O                            | 0.76 | 0.84     |       |
| All Dimensions in millimeter |      |          |       |

TO-220F

|                              |      |          |       |
|------------------------------|------|----------|-------|
|                              | Dim. | Min.     | Max.  |
|                              | A    | 9.95     | 10.25 |
|                              | B    | 2.95     | 3.25  |
|                              | C    | 1.25     | 1.45  |
|                              | D    | 12.95    | 13.25 |
|                              | E    | 0.50     | 0.65  |
|                              | F    | 3.1      | 3.3   |
|                              | G    | 1.30     | 1.45  |
|                              | H    | Typ 2.54 |       |
|                              | I    | Typ 5.08 |       |
|                              | J    | 4.60     | 4.75  |
|                              | K    | 2.50     | 2.65  |
|                              | L    | 6.35     | 6.55  |
|                              | M    | 15.4     | 16.0  |
|                              | N    | 2.75     | 3.05  |
| O                            | 0.48 | 0.52     |       |
| P                            | 0.76 | 0.84     |       |
| All Dimensions in millimeter |      |          |       |

Package Outline Dimensions Millimeters

TO-263

| Dim.                         | Min.    | Max. |
|------------------------------|---------|------|
| A                            | 10.1    | 10.2 |
| B                            | 7.4     | 7.6  |
| C                            | 1.3     | 1.5  |
| D                            | 0.55    | 0.75 |
| E                            | 5.0     | 6.0  |
| F                            | 1.4     | 1.6  |
| G                            | 0.78    | 0.86 |
| H                            | 1.2     | 1.3  |
| I                            | Typ2.54 |      |
| J                            | 8.4     | 8.6  |
| K                            | 4.45    | 4.55 |
| L                            | 1.25    | 1.35 |
| M                            | 0.02    | 0.1  |
| N                            | 2.4     | 2.8  |
| O                            | 0.36    | 0.40 |
| All Dimensions in millimeter |         |      |