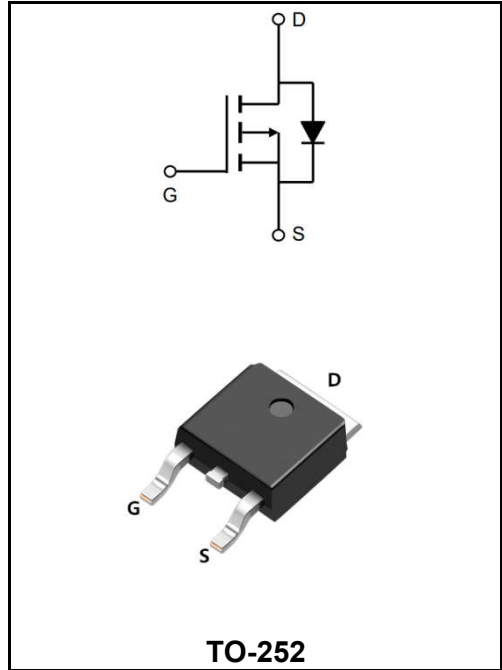


**-60V P-CHANNEL ENHANCEMENT MODE MOSFET**

**MAIN CHARACTERISTICS**

|  |                             |
|--|-----------------------------|
| <b>I<sub>D</sub></b>                                 | -30A                        |
| <b>V<sub>DSS</sub></b>                               | -60V                        |
| <b>R<sub>DS(on)-typ</sub>(@V<sub>GS</sub>= -10V)</b> | <-25mΩ( <b>Type:21 mΩ</b> ) |



**Application**

- ◆Lithium battery protection
- ◆Wireless impact
- ◆Mobile phone fast charging

**Product Specification Classification**

| Part Number | Package | Marking           | Pack         |
|-------------|---------|-------------------|--------------|
| YFW30P06AD  | TO-252  | YFW 30P06AD XXXXX | 2500PCS/Tape |

**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>  | -60         | <b>V</b>    |
| Gate - Source Voltage  | <b>V<sub>GS</sub></b>  | ±20         | <b>V</b>    |
| Continuous Drain Current, V <sub>GS</sub> @ -10V <sup>1</sup> @T <sub>c</sub> =25°C  | <b>I<sub>D</sub></b>   | -30         | <b>A</b>    |
| Continuous Drain Current, V <sub>GS</sub> @ -10V <sup>1</sup> @T <sub>c</sub> =100°C | <b>I<sub>D</sub></b>   | -27         | <b>A</b>    |
| Pulsed Drain Current <sup>2</sup>  | <b>I<sub>DM</sub></b>  | -70         | <b>A</b>    |
| Single Pulse Avalanche Energy <sup>3</sup>   | <b>E<sub>AS</sub></b>  | 113         | <b>mJ</b>   |
| Avalanche Current  | <b>I<sub>AS</sub></b>  | 47.6        | <b>A</b>    |
| Total Power Dissipation <sup>4</sup> @T <sub>c</sub> =25°C                           | <b>P<sub>D</sub></b>   | 52.1        | <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 <sup>1</sup>                                     | <b>R<sub>θJA</sub></b> | 62          | <b>°C/W</b> |
| Thermal Resistance Junction to Case <sup>1</sup>                                     | <b>R<sub>θJC</sub></b> | 2.4         | <b>°C/W</b> |

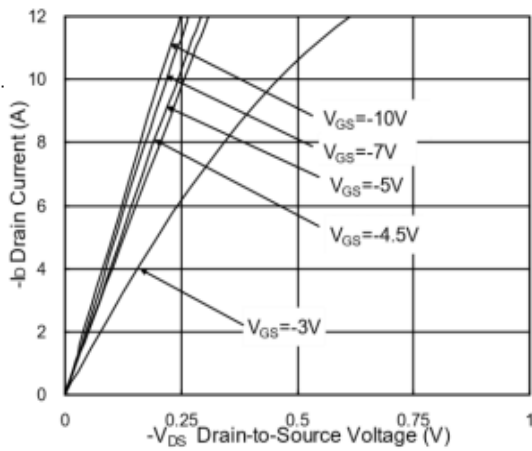
**Maximum Ratings at Tc=25°C unless otherwise specified**

| Characteristics                                | Test Condition   | Symbols                      | Min  | Typ    | Max  | Units |
|--|--|------------------------------|------|--------|------|-------|
| Drain-Source Breakdown Voltage                 | $V_{GS}=0V, I_D=-250\mu A$                                     | $BV_{DSS}$                   | -60  | -68    | -    | V     |
| $BV_{DSS}$ Temperature Coefficient             | Reference to 25°C, $I_D=-1mA$                                  | $\Delta BV_{DSS}/\Delta T_J$ | -    | -0.035 | -    | V/°C  |
| Static Drain-Source On-Resistance <sup>2</sup> | $V_{GS}=-10V, I_D=-10A$  | $R_{DS(ON)}$                 | -    | 21     | 25   | mΩ    |
|  | $V_{GS}=-4.5V, I_D=-8A$  |                              | -    | 26     | 33   |       |
| Gate -Threshold Voltage                        | $V_{DS}=V_{GS}, I_D=-250\mu A$                                 | $V_{GS(th)}$                 | -1.0 | -1.5   | -2.5 | V     |
| $V_{GS(th)}$ Temperature Coefficient           |  | $\Delta V_{GS(th)}$          | -    | 4.28   | -    | mV/°C |
| Drain-Source Leakage Current                   | $V_{DS}=-48V, V_{GS}=0V, T_J=25^\circ C$                       | $I_{DSS}$                    | -    | -      | 1    | μA    |
|  | $V_{DS}=-48V, V_{GS}=0V, T_J=55^\circ C$                       |                              | -    | -      | 5    |       |
| Gate -Source Leakage Current                   | $V_{GS}=\pm 20V, V_{DS}=0V$                                    | $I_{GSS}$                    | -    | -      | ±100 | nA    |
| Forward Transconductance                       | $V_{DS}=-10V, I_D=-18A$  | $g_{fs}$                     | -    | 23     | -    | S     |
| Gate Resistance                                | $V_{DS}=0V, V_{GS}=0V, f=1MHz$                                 | $R_g$                        | -    | 7      | -    | Ω     |
| Total Gate Charge(-4.5V)                       | $V_{DS}=-20V$<br>$V_{GS}=-4.5V$<br>$I_D=-12A$                  | $Q_g$                        | -    | 25     | -    | nC    |
| Gate-Source Charge                             |  | $Q_{gs}$                     | -    | 6.7    | -    |       |
| Gate-Drain Charge                              |  | $Q_{gd}$                     | -    | 5.5    | -    |       |
| Turn-on delay time                             | $V_{DD}=-15V$<br>$V_{GS}=-10V$<br>$I_D=-1A$<br>$R_G=3.3\Omega$ | $t_{d(on)}$                  | -    | 38     | -    | ns    |
| Rise Time                                      |  | $T_r$                        | -    | 23.6   | -    |       |
| Turn-Off Delay Time                            |  | $t_{d(OFF)}$                 | -    | 100    | -    |       |
| Fall Time                                      |  | $t_f$                        | -    | 6.8    | -    |       |
| Input Capacitance                              | $V_{DS}=-15V$<br>$V_{GS}=0V$<br>$f=1MHz$                       | $C_{iss}$                    | -    | 3635   | -    | pF    |
| Output Capacitance                             |  | $C_{oss}$                    | -    | 224    | -    |       |
| Reverse Transfer Capacitance                   |  | $C_{rss}$                    | -    | 141    | -    |       |
| Continuous Source Current <sup>1,5</sup>       | $V_G=V_D=0V, \text{Force Current}$                             | $I_S$                        | -    | -      | -35  | A     |
| Pulsed Source Current <sup>2,5</sup>           |  | $I_{SM}$                     | -    | -      | -70  | A     |
| Diode Forward Voltage <sup>2</sup>             | $V_{GS}=0V, I_S=-1A, T_J=25^\circ C$                           | $V_{SD}$                     | -    | -      | -1   | V     |

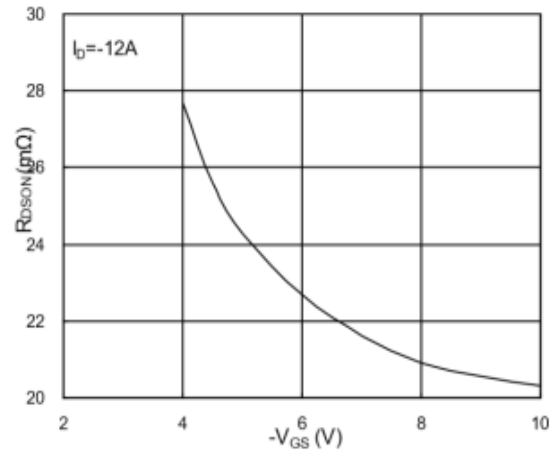
Note :

- 1、 The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
- 2、 The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$
- 3、 The EAS data shows Max. rating . The test condition is  $V_{DD}=-25V, V_{GS}=-10V, L=0.1mH, I_{AS}=-47.6A$
- 4、 The power dissipation is limited by 150°C junction temperature
- 5、 The data is theoretically the same as  $I_D$  and  $I_{DM}$  , in real applications , should be limited by total power dissipation.

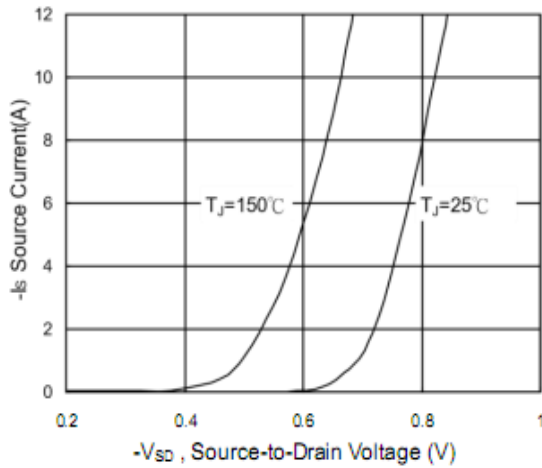
**Ratings and Characteristic Curves**



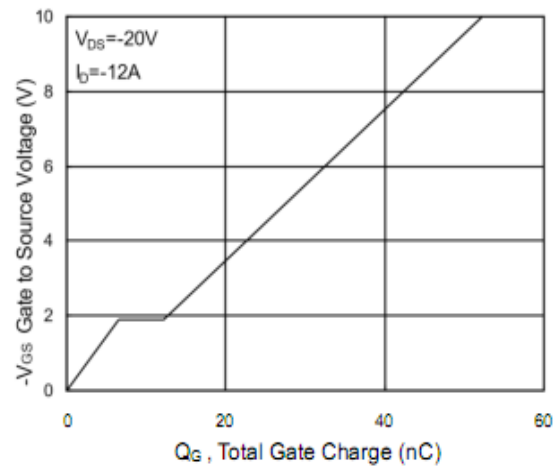
**Fig.1 Typical Output Characteristics**



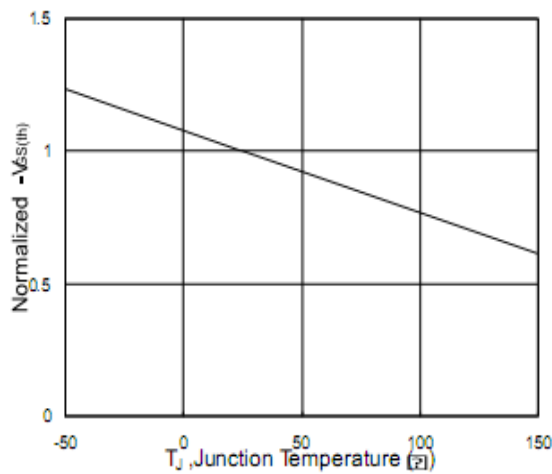
**Fig.2 On-Resistance v.s Gate-Source**



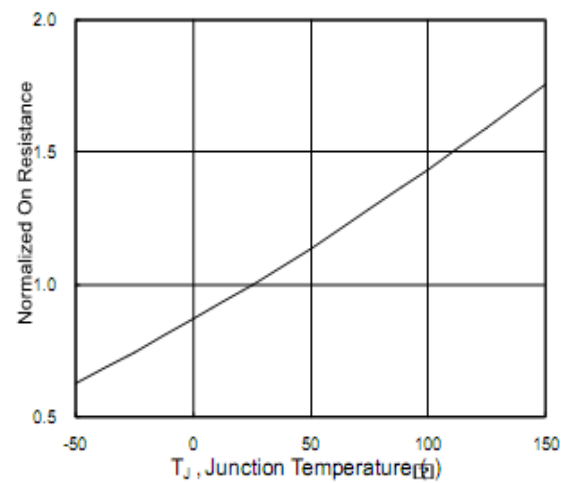
**Fig.3 Forward Characteristics Of Reverse**



**Fig.4 Gate-Charge Characteristics**

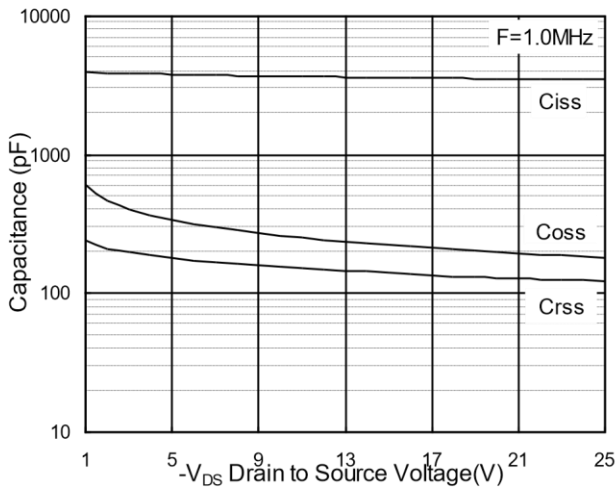


**Fig.5 Normalized  $V_{GS(th)}$  v.s  $T_J$**

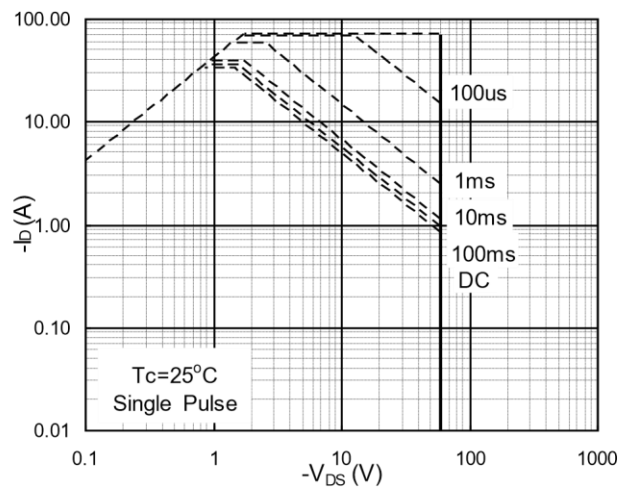


**Fig.6 Normalized  $R_{DS(on)}$  v.s  $T_J$**

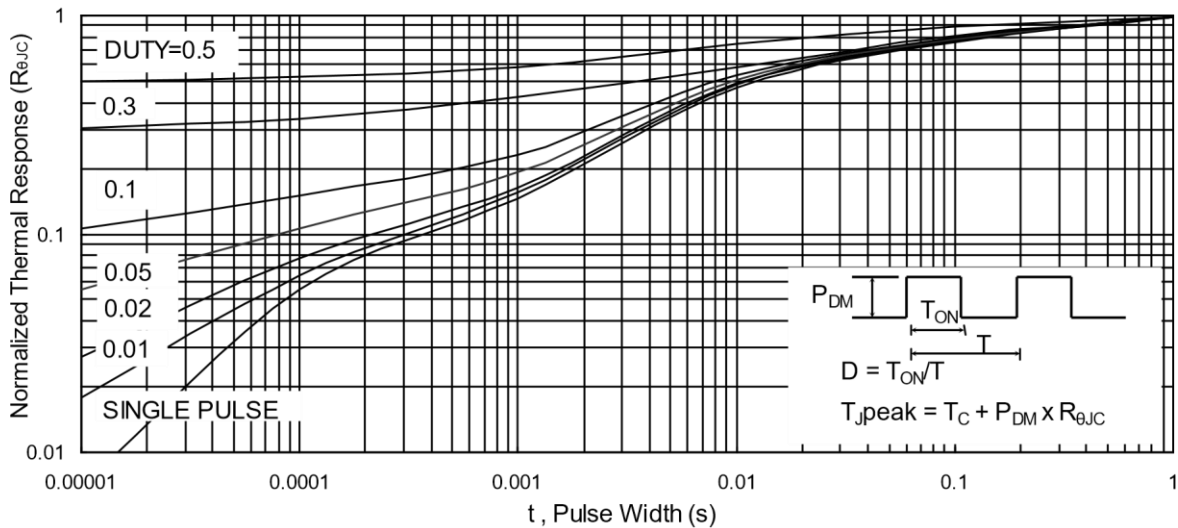
**Ratings and Characteristic Curves**



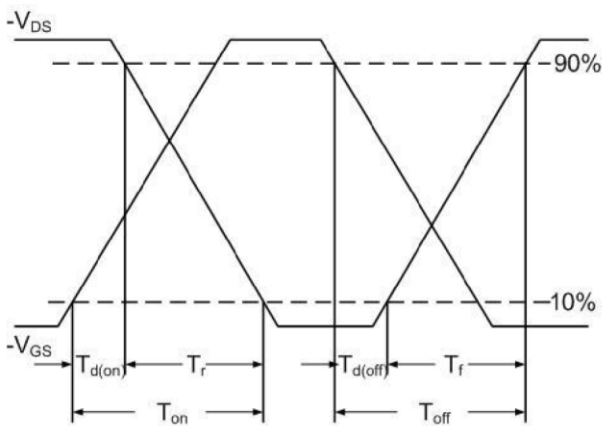
**Fig.7 Capacitance**



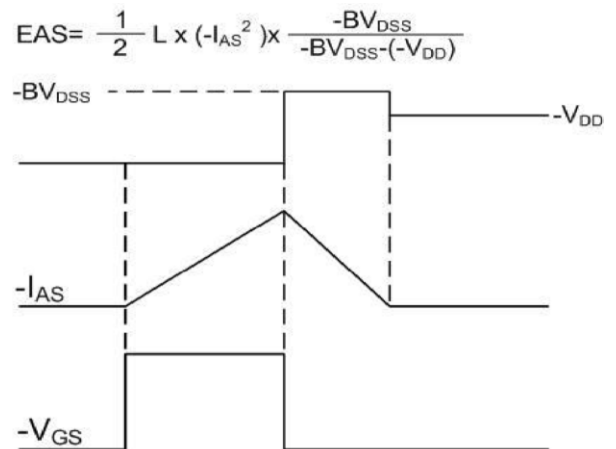
**Fig.8 Safe Operating Area**



**Fig.9 Normalized Maximum Transient Thermal Impedance**



**Fig.10 Switching Time Waveform**



**Fig.11 Unclamped Inductive Waveform**

Package Outline Dimensions Millimeters

TO-252

| Dim.                         | Min.    | Typ. | Max.  |
|------------------------------|---------|------|-------|
| A                            | 2.10    | -    | 2.50  |
| A2                           | 0       | -    | 0.10  |
| B                            | 0.66    | -    | 0.86  |
| B2                           | 5.18    | -    | 5.48  |
| C                            | 0.40    | -    | 0.60  |
| C2                           | 0.44    | -    | 0.58  |
| D                            | 5.90    | -    | 6.30  |
| D1                           | 5.30REF |      |       |
| E                            | 6.40    | -    | 6.80  |
| E1                           | 4.63    | -    | -     |
| G                            | 4.47    | -    | 4.67  |
| H                            | 9.50    | -    | 10.70 |
| L                            | 1.09    | -    | 1.21  |
| L2                           | 1.35    | -    | 1.65  |
| V1                           | -       | 7°   | -     |
| V2                           | 0°      | -    | 6°    |
| All Dimensions in millimeter |         |      |       |

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