

**30V N- Channel Advanced Power MOSFET**

**MAIN CHARACTERISTICS**

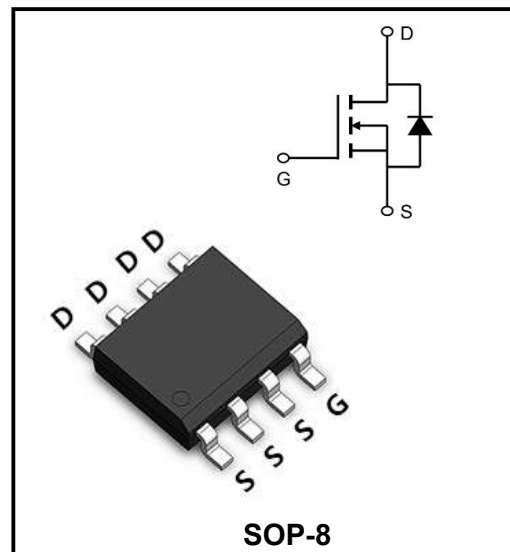
|                                                    |                           |
|----------------------------------------------------|---------------------------|
| <b>I<sub>D</sub></b>                               | 20A                       |
| <b>V<sub>DSS</sub></b>                             | 30V                       |
| <b>R<sub>DS(on)-typ</sub>(@V<sub>GS</sub>=10V)</b> | <6.5mΩ ( <b>Typ:5mΩ</b> ) |

**FEATURES**

- ♦ Improved dv/dt capability
- ♦ Fast switching
- ♦ Green Device Available

**Applications**

- ♦ Notebook
- ♦ Load Switch
- ♦ LED applications
- ♦ Hand-Held Device



**Absolute Maximum Ratings Tc=25°C unless otherwise noted**

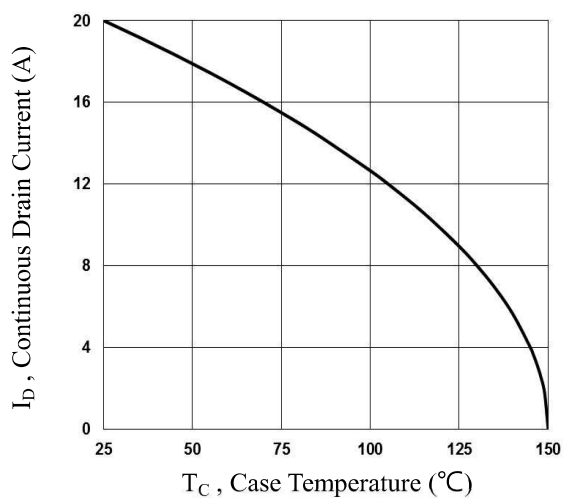
| Characteristics                         | Symbols                | Value       | Units       |
|-----------------------------------------|------------------------|-------------|-------------|
| Drain-Source Voltage                    | <b>V<sub>DS</sub></b>  | 30          | <b>V</b>    |
| Gate - Source Voltage                   | <b>V<sub>GS</sub></b>  | ±20         | <b>V</b>    |
| Drain Current – Continuous (Tc=25°C)    | <b>I<sub>D</sub></b>   | 20          | <b>A</b>    |
| Drain Current – Continuous (Tc=100°C)   |                        | 12.6        | <b>A</b>    |
| Pulsed Drain Current <sup>†</sup>       | <b>I<sub>DM</sub></b>  | 80          | <b>A</b>    |
| Power Dissipation (Tc=25°C)             | <b>P<sub>D</sub></b>   | 5.4         | <b>W</b>    |
| Power Dissipation – Derate above 25°C   |                        | 0.043       | <b>W/°C</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-to-Ambient | <b>R<sub>θJA</sub></b> | 85          | <b>°C/W</b> |
| Thermal Resistance Junction-Case        | <b>R<sub>θJC</sub></b> | 23          | <b>°C/W</b> |

**Electrical Characteristics at Tc=25°C unless otherwise specified**

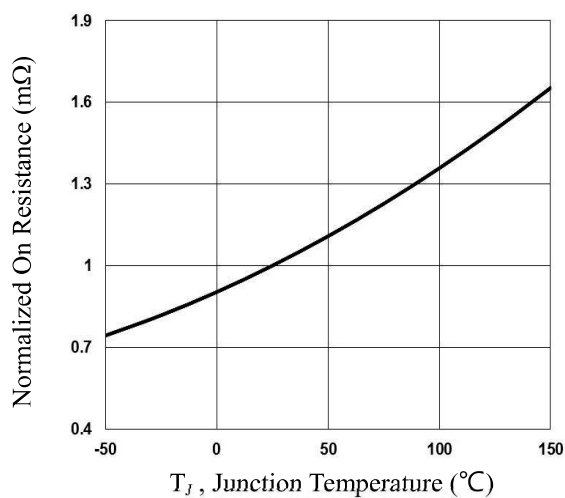
| Characteristics                   | Test Condition                                               | Symbols                      | Min | Typ  | Max       | Units   |
|-----------------------------------|--------------------------------------------------------------|------------------------------|-----|------|-----------|---------|
| Drain-Source Breakdown Voltage    | $V_{GS}=0V, I_D=250\mu A$                                    | $BV_{DSS}$                   | 30  | -    | -         | V       |
| BVDSS Temperature Coefficient     | Reference to 25°C , $I_D=1mA$                                | $\Delta BV_{DSS}/\Delta T_J$ | -   | 0.04 | -         | V/°C    |
| Drain -Source Leakage Current     | $V_{DS}=30V, V_{GS}=0V, T_J=25^\circ C$                      | $I_{DSS}$                    | -   | -    | 1         | $\mu A$ |
|                                   | $V_{DS}=24V, V_{GS}=0V, T_J=125^\circ C$                     |                              | -   | -    | 10        |         |
| Gate-Source Leakage Current       | $V_{GS}=\pm 20V, V_{DS}=0V$                                  | $I_{GSS}$                    | -   | -    | $\pm 100$ | nA      |
| Static Drain-Source On-Resistance | $V_{GS}=10V, I_D=10A$                                        | $R_{DS(ON)}$                 | -   | 5    | 6.5       | mΩ      |
|                                   | $V_{GS}=4.5V, I_D=5A$                                        |                              | -   | 8    | 11        | mΩ      |
| Gate -Threshold Voltage           | $V_{DS}=V_{GS}, I_D=250\mu A$                                | $V_{GS(th)}$                 | 1.0 | 1.6  | 2.5       | V       |
| VGS(th) Temperature Coefficient   |                                                              | $\Delta V_{GS(th)}$          | -   | -4   | -         | mV/°C   |
| Forward Transconductance          | $V_{DS}=10V, I_D=10A$                                        | $g_{fs}$                     |     | 18   |           | S       |
| Total Gate Charge                 | $V_{DS}=15V$<br>$V_{GS}=4.5V$<br>$I_D=20A$                   | $Q_G$                        | -   | 11.1 | 22        | nC      |
| Gate to Source Charge             |                                                              | $Q_{GS}$                     | -   | 1.85 | 3.7       | nC      |
| Gate to Drain Charge              |                                                              | $Q_{GD}$                     | -   | 6.8  | 13        | nC      |
| Turn-on delay time                | $V_{DD}=15V$<br>$V_{GS}=10V$<br>$R_G=3.3\Omega$<br>$I_D=15A$ | $t_{d(on)}$                  | -   | 7.5  | 15        | ns      |
| Rise Time                         |                                                              | $T_r$                        | -   | 14.5 | 28        | ns      |
| Turn-Off Delay Time               |                                                              | $t_{d(OFF)}$                 | -   | 35.2 | 60        | ns      |
| Fall Time                         |                                                              | $t_f$                        | -   | 9.6  | 19        | ns      |
| Input Capacitance                 | $V_{DS}=25V$<br>$V_{GS}=0V$<br>$F=1MHz$                      | $C_{iss}$                    | -   | 1160 | 1900      | pF      |
| Output Capacitance                |                                                              | $C_{oss}$                    | -   | 200  | 400       | pF      |
| Reverse Transfer Capacitance      |                                                              | $C_{rss}$                    | -   | 180  | 360       | pF      |
| Gate resistance                   | $V_{GS}=0V, V_{DS}=0V, F=1MHz$                               | $R_g$                        |     | 2.5  | 5         | Ω       |
| Continuous Source Current         | $V_G=V_D=0V$ , Force Current                                 | $I_S$                        | -   | -    | 20        | A       |
| Pulsed Source Current             |                                                              | $I_{SM}$                     | -   | -    | 40        | A       |
| Diode Forward Voltage             | $V_{GS}=0V, I_S=1A, T_J=25^\circ C$                          | $V_{SD}$                     | -   | -    | 1         | V       |

Note :

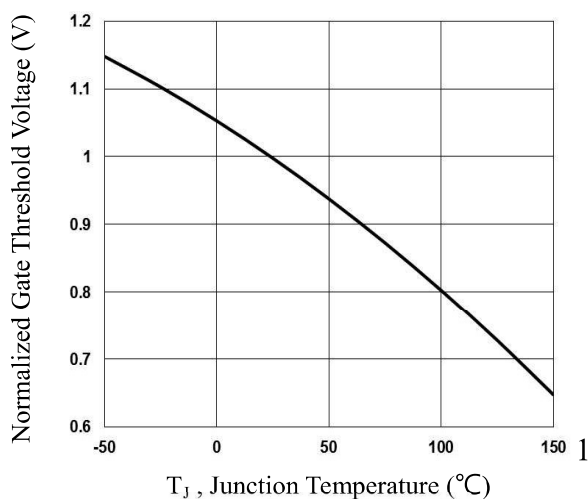
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$ .
3. Essentially independent of operating temperature.



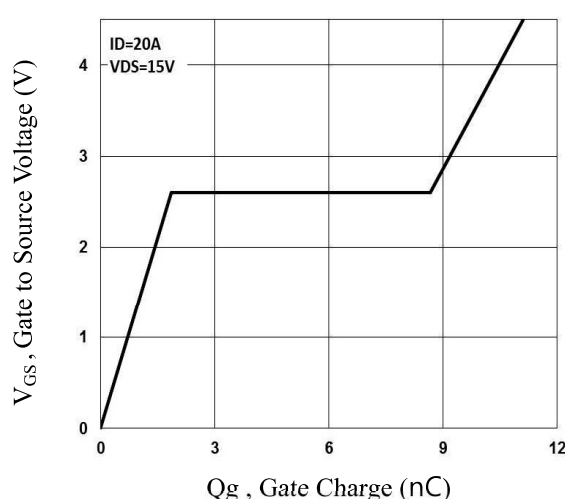
**Fig.1 Continuous Drain Current vs.  $T_c$**



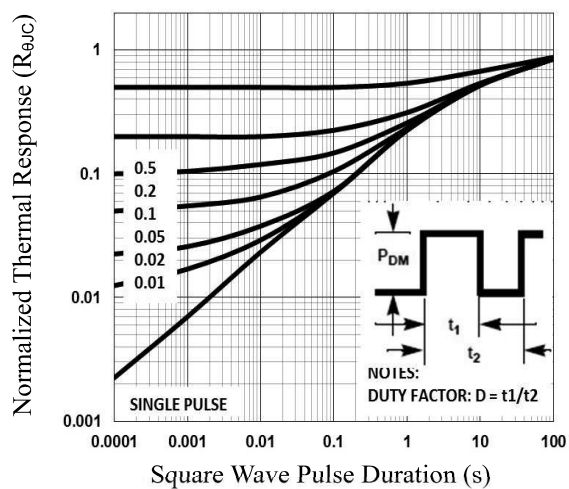
**Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_j$**



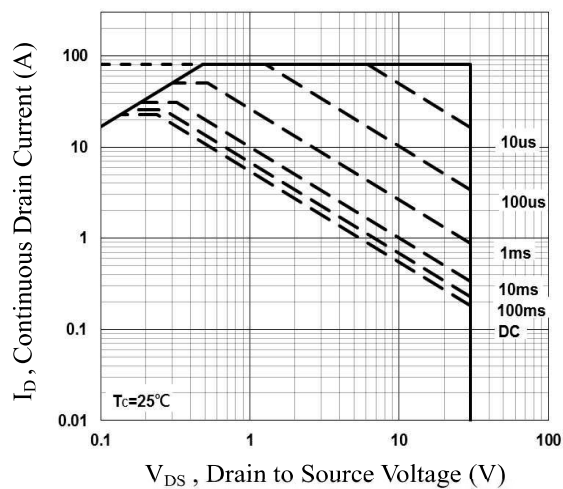
**Fig.3 Normalized  $V_{th}$  vs.  $T_j$**



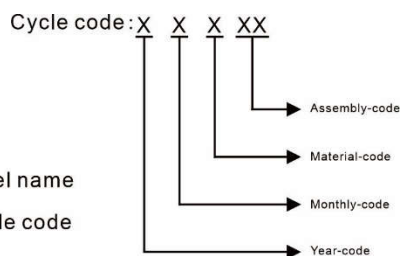
**Fig.4 Gate Charge Waveform**



**Fig.5 Normalized Transient Impedance**



**Fig.6 Maximum Safe Operation Area**

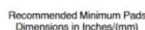


| Package | Packing Description | Packing Quantity             |
|---------|---------------------|------------------------------|
| SOP-8   | Tape/Reel,13"reel   | 3000PCS/Reel 30000PCS/Carton |

## SOP-8

Technical drawing of a rectangular component with dimensions and a side view. The main view shows a rectangular block with a central hole. Dimensions include overall width  $D$ , overall height  $E$ , inner height  $E1$ , and a small circular feature. The side view shows the component's profile with dimensions  $L$ ,  $h$ ,  $c$ , and an angle  $\theta$ .

### The recommended mounting pad size



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