

**N-Ch 100V Fast Switching MOSFETs**
**General Description**

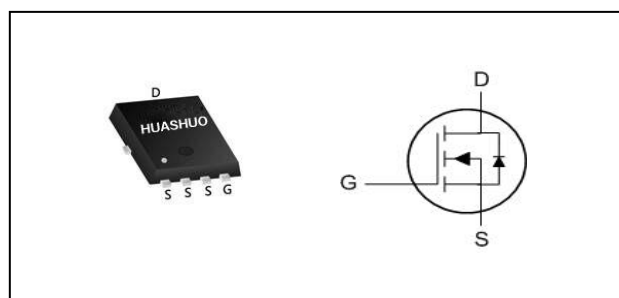
- 100% EAS Guaranteed
- Green Device Available
- Super Low  $R_{DS(ON)}$
- Advanced high cell density Trench technology

**Applications**

- MOTOR Driver.
- BMS.
- High frequency switching and synchronous rectification.

**Product Summary**

|                  |     |            |
|------------------|-----|------------|
| $V_{DS}$         | 100 | V          |
| $R_{DS(ON),typ}$ | 2.7 | m $\Omega$ |
| $I_D$            | 150 | A          |

**PRPAK5\*6 Pin Configuration**

**Absolute Maximum Ratings**

| Symbol                 | Parameter                                      | Rating     | Units       |
|------------------------|------------------------------------------------|------------|-------------|
| $V_{DS}$               | Drain-Source Voltage                           | 100        | V           |
| $V_{GS}$               | Gate-Source Voltage                            | $\pm 20$   | V           |
| $I_D@T_C=25^{\circ}C$  | Continuous Drain Current, $V_{GS} @ 10V^{1,6}$ | 150        | A           |
| $I_D@T_C=100^{\circ}C$ | Continuous Drain Current, $V_{GS} @ 10V^{1,6}$ | 110        | A           |
| $I_{DM}$               | Pulsed Drain Current <sup>2</sup>              | 600        | A           |
| EAS                    | Single Pulse Avalanche Energy <sup>3</sup>     | 732        | mJ          |
| $I_{AS}$               | Avalanche Current                              | 60         | A           |
| $P_D@T_C=25^{\circ}C$  | Total Power Dissipation <sup>4</sup>           | 220        | W           |
| $T_{STG}$              | Storage Temperature Range                      | -55 to 150 | $^{\circ}C$ |
| $T_J$                  | Operating Junction Temperature Range           | -55 to 150 | $^{\circ}C$ |

**Thermal Data**

| Symbol          | Parameter                                        | Typ. | Max. | Unit          |
|-----------------|--------------------------------------------------|------|------|---------------|
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient <sup>1</sup> | ---  | 50   | $^{\circ}C/W$ |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case <sup>1</sup>    | ---  | 0.52 | $^{\circ}C/W$ |

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**Electrical Characteristics ( $T_J=25^\circ\text{C}$ , unless otherwise noted)**

| Symbol       | Parameter                                      | Conditions                                                   | Min. | Typ. | Max.      | Unit      |
|--------------|------------------------------------------------|--------------------------------------------------------------|------|------|-----------|-----------|
| $BV_{DSS}$   | Drain-Source Breakdown Voltage                 | $V_{GS}=0V$ , $I_D=250\mu A$                                 | 100  | ---  | ---       | V         |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance <sup>2</sup> | $V_{GS}=10V$ , $I_D=30A$                                     | ---  | 2.7  | 3.2       | $m\Omega$ |
| $V_{GS(th)}$ | Gate Threshold Voltage                         | $V_{GS}=V_{DS}$ , $I_D=250\mu A$                             | 2.0  | 3.0  | 4.0       | V         |
| $I_{DSS}$    | Drain-Source Leakage Current                   | $V_{DS}=100V$ , $V_{GS}=0V$ , $T_J=25^\circ\text{C}$         | ---  | ---  | 1         | $\mu A$   |
|              |                                                | $V_{DS}=100V$ , $V_{GS}=0V$ , $T_J=125^\circ\text{C}$        | ---  | ---  | 10        |           |
| $I_{GSS}$    | Gate-Source Leakage Current                    | $V_{GS}=\pm 20V$ , $V_{DS}=0V$                               | ---  | ---  | $\pm 100$ | nA        |
| $R_g$        | Gate Resistance                                | $V_{DS}=0V$ , $V_{GS}=0V$ , $f=1\text{MHz}$                  | ---  | 1.5  | ---       | $\Omega$  |
| $Q_g$        | Total Gate Charge (10V)                        | $V_{DS}=50V$ , $V_{GS}=10V$ , $I_D=20A$                      | ---  | 112  | ---       | nC        |
| $Q_{gs}$     | Gate-Source Charge                             |                                                              | ---  | 25   | ---       |           |
| $Q_{gd}$     | Gate-Drain Charge                              |                                                              | ---  | 23   | ---       |           |
| $T_d(on)$    | Turn-On Delay Time                             | $V_{DD}=50V$ , $V_{GS}=10V$ , $R_G=6.0\Omega$ ,<br>$I_D=20A$ | ---  | 35   | ---       | ns        |
| $T_r$        | Rise Time                                      |                                                              | ---  | 44   | ---       |           |
| $T_d(off)$   | Turn-Off Delay Time                            |                                                              | ---  | 125  | ---       |           |
| $T_f$        | Fall Time                                      |                                                              | ---  | 65   | ---       |           |
| $C_{iss}$    | Input Capacitance                              | $V_{DS}=50V$ , $V_{GS}=0V$ , $f=1\text{MHz}$                 | ---  | 7425 | ---       | pF        |
| $C_{oss}$    | Output Capacitance                             |                                                              | ---  | 1621 | ---       |           |
| $C_{rss}$    | Reverse Transfer Capacitance                   |                                                              | ---  | 64   | ---       |           |

**Diode Characteristics**

| Symbol   | Parameter                                | Conditions                                                 | Min. | Typ. | Max. | Unit |
|----------|------------------------------------------|------------------------------------------------------------|------|------|------|------|
| $I_S$    | Continuous Source Current <sup>1,5</sup> | $V_G=V_D=0V$ , Force Current                               | ---  | ---  | 120  | A    |
| $V_{SD}$ | Diode Forward Voltage <sup>2</sup>       | $V_{GS}=0V$ , $I_S=50A$ , $T_J=25^\circ\text{C}$           | ---  | ---  | 1.0  | V    |
| $t_{rr}$ | Reverse Recovery Time                    | $I_F=20A$ , $dI/dt=100A/\mu s$ ,<br>$T_J=25^\circ\text{C}$ | ---  | 86   | ---  | nS   |
| $Q_{rr}$ | Reverse Recovery Charge                  |                                                            | ---  | 181  | ---  | nC   |

Note :

1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 20Z copper.

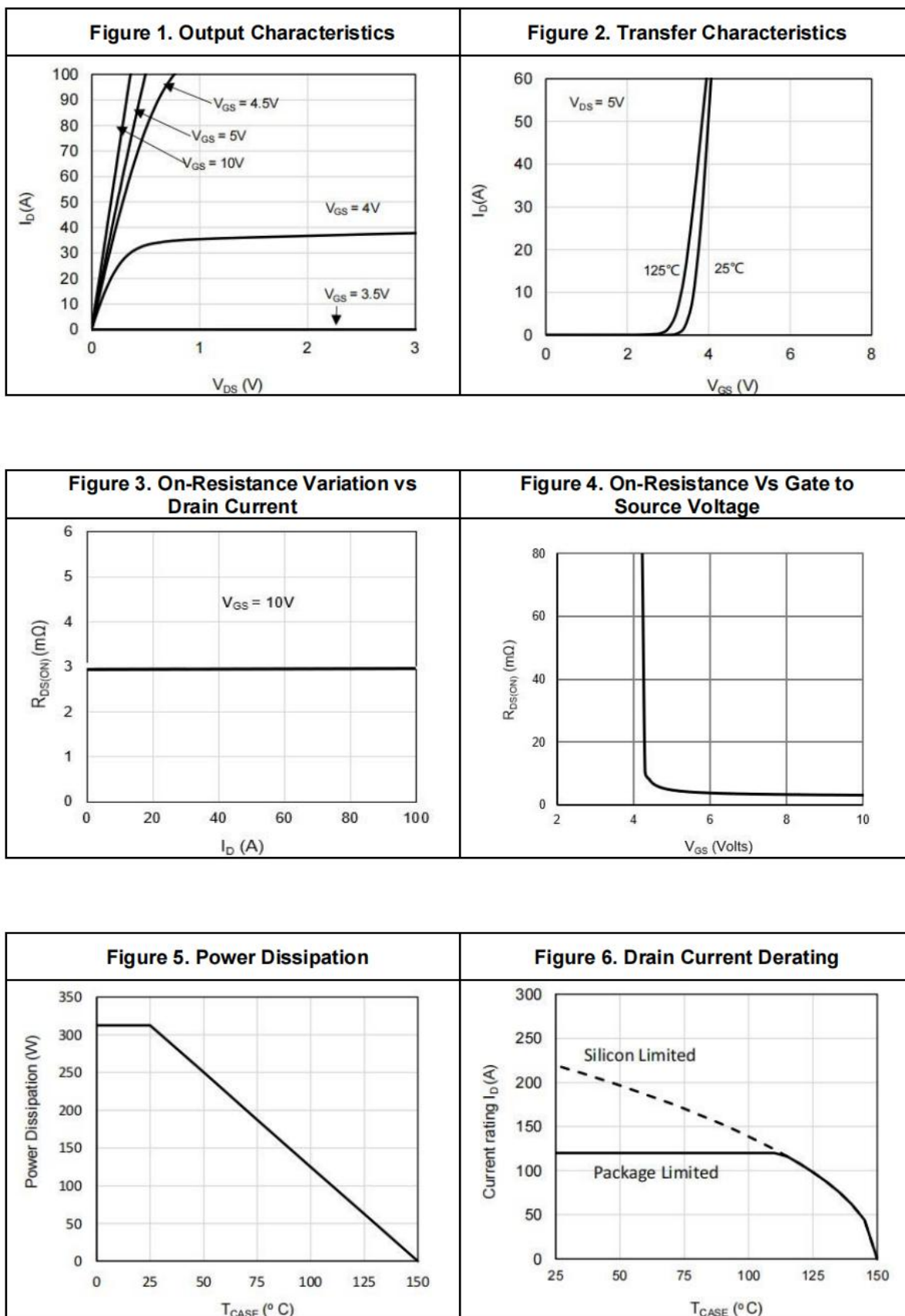
2.The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$

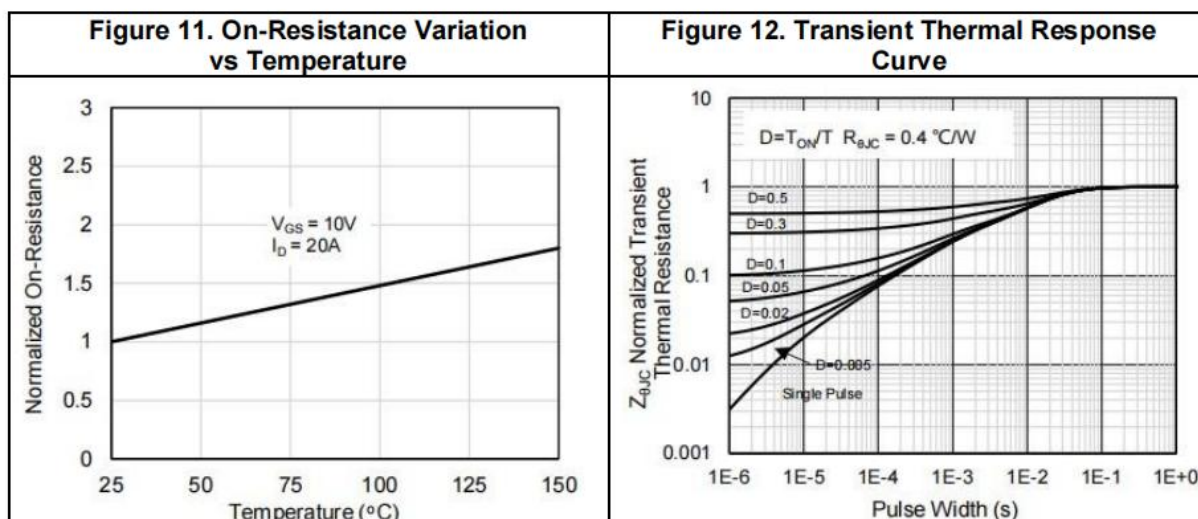
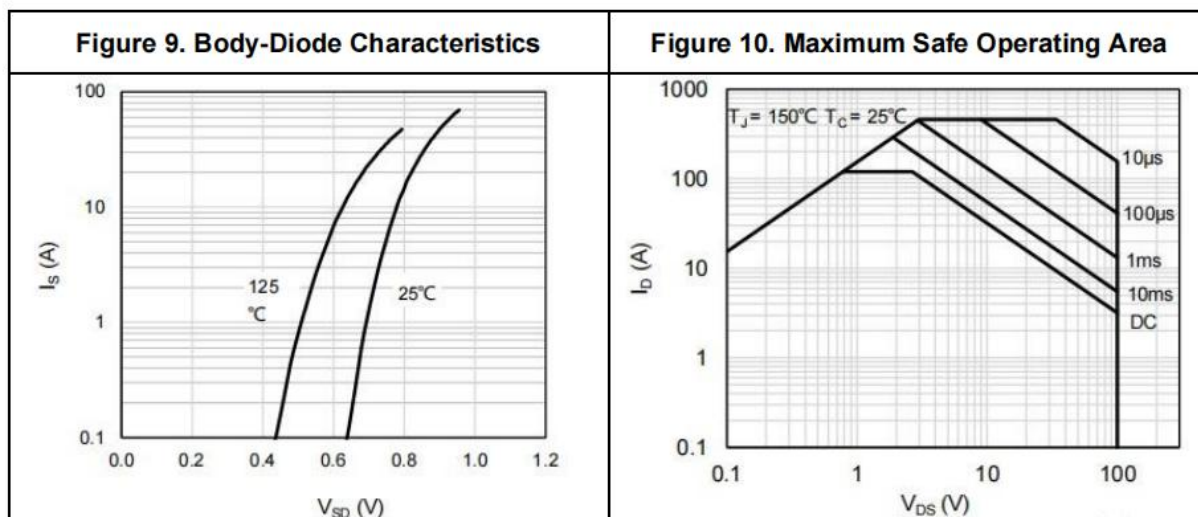
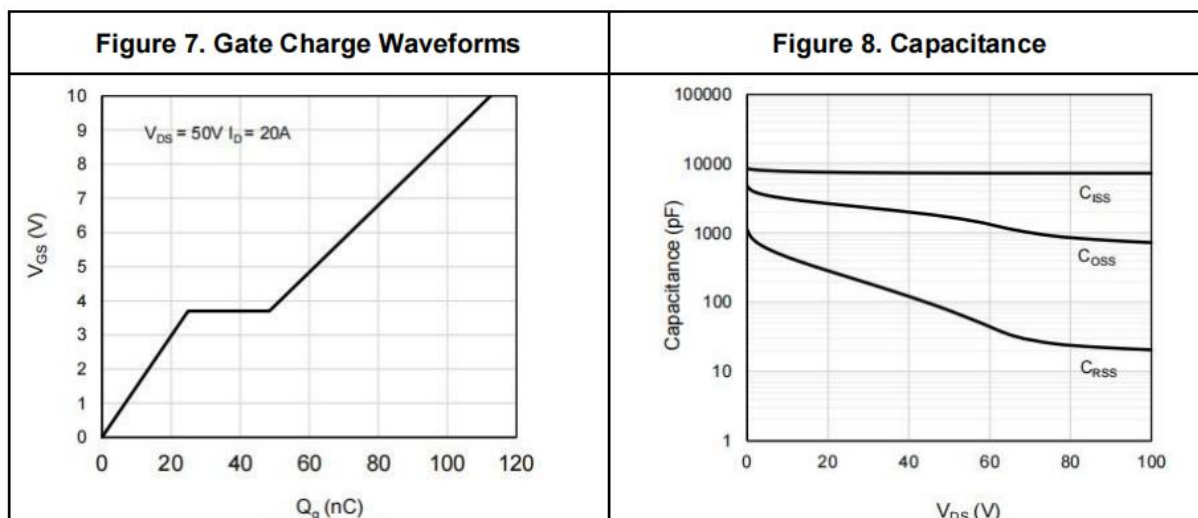
3.The EAS data shows Max. rating . The test condition is  $V_{DD}=25V$ ,  $V_{GS}=10V$ ,  $L=0.5mH$ ,  $I_{AS}=60A$

4.The power dissipation is limited by  $150^\circ\text{C}$  junction temperature

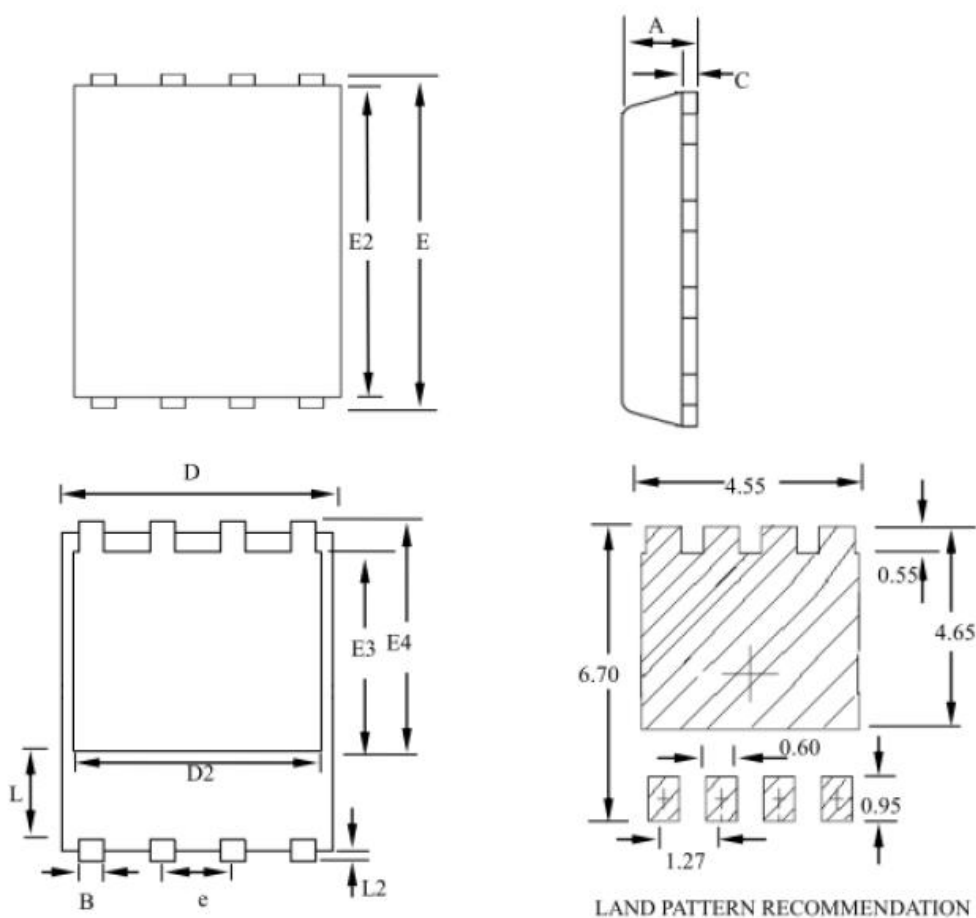
5.The data is theoretically the same as  $I_D$  and  $I_{DM}$  , in real applications , should be limited by total power dissipation.

6.Package limitation current.

**Typical Characteristics**


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## PRPAK5X6 Package Outline Dimensions



| SYMBOLS | MILLIMETERS |      |      | INCHES |       |       |
|---------|-------------|------|------|--------|-------|-------|
|         | MIN         | NOM  | MAX  | MIN    | NOM   | MAX   |
| A       | 0.80        | --   | 1.20 | 0.031  | --    | 0.047 |
| B       | 0.30        | --   | 0.51 | 0.012  | --    | 0.020 |
| C       | 0.15        | --   | 0.35 | 0.006  | --    | 0.014 |
| D       | 4.80        | --   | 5.30 | 0.189  | --    | 0.209 |
| D2      | 3.61        | --   | 4.35 | 0.142  | --    | 0.171 |
| E       | 5.90        | --   | 6.35 | 0.232  | --    | 0.250 |
| E2      | 5.42        | --   | 5.90 | 0.213  | --    | 0.232 |
| E3      | 3.23        | --   | 3.90 | 0.127  | --    | 0.154 |
| E4      | 3.69        | --   | 4.55 | 0.145  | --    | 0.179 |
| L       | 0.61        | --   | 1.80 | 0.024  | --    | 0.071 |
| L2      | 0.05        | --   | 0.36 | 0.002  | --    | 0.014 |
| e       | --          | 1.27 | --   | --     | 0.050 | --    |