

**Features**

- Excellent Gate Charge x  $R_{DS(on)}$  Product(FOM)
- Very Low On-Resistance  $R_{DS(on)}$
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

**Maximum Ratings**

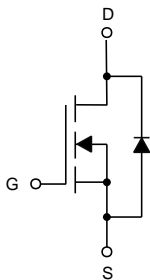
- Operating Junction Temperature Range : -55°C to +175°C
- Storage Temperature Range: -55°C to +175°C
- Thermal Resistance: 2.2°C/W Junction to Case<sup>(Note 1)</sup>

| Parameter   | Symbol   | Rating                  | Unit |
|---|----------|-------------------------|------|
| Drain-Source Voltage                              | $V_{DS}$ | 150                     | V    |
| Gate-Source Voltage                               | $V_{GS}$ | ±20                     | V    |
| Continuous Drain Current                          | $I_D$    | $T_C=25^\circ\text{C}$  | 20   |
|   |          | $T_C=100^\circ\text{C}$ | 14   |
| Pulsed Drain Current                              | $I_{DM}$ | 80                      | A    |
| Single Pulse Avalanche Energy <sup>(Note 2)</sup> | $E_{AS}$ | 65                      | mJ   |
| Total Power Dissipation                           | $P_D$    | 68                      | W    |

Note: 1. Surface Mounted on FR4 Board,  $t \leq 10$  sec.

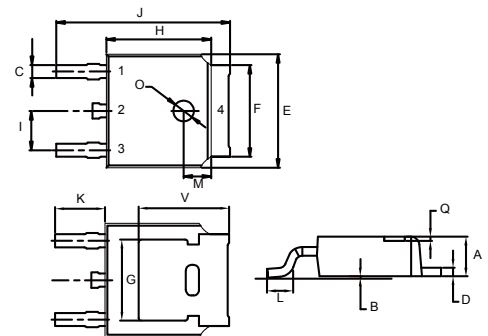
2. EAS Condition :  $T_J=25^\circ\text{C}, V_{DD}=50\text{V}, V_G=10\text{V}, L=0.5\text{mH}, R_g=25\Omega$ .

**Internal Structure**



**N-CHANNEL  
MOSFET**

**DPAK(TO-252)**



- 1. Gate
- 2,4. Drain
- 3. Source

| DIM | DIMENSIONS |       |      |       | NOTE |
|-----|------------|-------|------|-------|------|
|     | INCHES     |       | MM   |       |      |
|     | MIN        | MAX   | MIN  | MAX   |      |
| A   | 0.087      | 0.094 | 2.20 | 2.40  |      |
| B   | 0.000      | 0.005 | 0.00 | 0.13  |      |
| C   | 0.026      | 0.034 | 0.66 | 0.86  |      |
| D   | 0.018      | 0.023 | 0.46 | 0.58  |      |
| E   | 0.256      | 0.264 | 6.50 | 6.70  |      |
| F   | 0.201      | 0.215 | 5.10 | 5.46  |      |
| G   | 0.190      |       | 4.83 |       | TYP. |
| H   | 0.236      | 0.244 | 6.00 | 6.20  |      |
| I   | 0.086      | 0.094 | 2.18 | 2.39  |      |
| J   | 0.386      | 0.409 | 9.80 | 10.40 |      |
| K   | 0.114      |       | 2.90 |       | TYP. |
| L   | 0.055      | 0.067 | 1.40 | 1.70  |      |
| M   | 0.063      |       | 1.60 |       | TYP. |
| O   | 0.043      | 0.051 | 1.10 | 1.30  |      |
| Q   | 0.000      | 0.012 | 0.00 | 0.30  |      |
| V   | 0.211      |       | 5.35 |       | TYP. |

**Electrical Characteristics @ 25°C (Unless Otherwise Specified)**

| Parameter   | Symbol        | Test Conditions  | Min | Typ  | Max       | Unit       |
|---|---------------|--|-----|------|-----------|------------|
| <b>Static Characteristics</b>                     |               |  |     |      |           |            |
| Drain-Source Breakdown Voltage                    | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$                                | 150 |      |           | V          |
| Gate-Source Leakage Current                       | $I_{GSS}$     | $V_{DS}=0V, V_{GS}=\pm 20V$                              |     |      | $\pm 100$ | nA         |
| Zero Gate Voltage Drain Current                   | $I_{DSS}$     | $V_{DS}=150V, V_{GS}=0V$                                 |     |      | 1         | $\mu A$    |
| Gate-Threshold Voltage <sup>(Note 3)</sup>        | $V_{GS(th)}$  | $V_{DS}=V_{GS}, I_D=250\mu A$                            | 2.5 | 3.3  | 4.5       | V          |
| Drain-Source On-Resistance <sup>(Note 3)</sup>    | $R_{DS(on)}$  | $V_{GS}=10V, I_D=10A$                                    |     | 59   | 65        | m $\Omega$ |
| Forward transconductance <sup>(Note 3)</sup>      | $g_{FS}$      | $V_{DS}=5V, I_D=10A$                                     | 15  |      |           | S          |
| <b>Dynamic Characteristics<sup>(Note 4)</sup></b> |               |  |     |      |           |            |
| Input Capacitance                                 | $C_{iss}$     | $V_{DS}=75V, V_{GS}=0V, f=1MHz$                          |     | 600  |           | pF         |
| Output Capacitance                                | $C_{oss}$     |  |     | 74.7 |           |            |
| Reverse Transfer Capacitance                      | $C_{rss}$     |  |     | 10.8 |           |            |
| Total Gate Charge                                 | $Q_g$         | $V_{DS}=75V, V_{GS}=10V, I_D=10A$                        |     | 12   |           | nC         |
| Gate-Source Charge                                | $Q_{gs}$      |  |     | 5.7  |           |            |
| Gate-Drain Charge                                 | $Q_{gd}$      |  |     | 2.7  |           |            |
| Turn-On Delay Time                                | $t_{d(on)}$   | $V_{DD}=75V, R_L=7.5\Omega$<br>$V_{GS}=10V, R_G=3\Omega$ |     | 9.5  |           | ns         |
| Turn-On Rise Time                                 | $t_r$         |  |     | 5.5  |           |            |
| Turn-Off Delay Time                               | $t_{d(off)}$  |  |     | 12.5 |           |            |
| Turn-Off Fall Time                                | $t_f$         |  |     | 3    |           |            |
| <b>Drain-Source Body Diode Characteristics</b>    |               |  |     |      |           |            |
| Continuous Body Diode Current                     | $I_S$         | $T_C=25^\circ C$   |     |      | 20        | A          |
| Body Diode Voltage <sup>(Note 3)</sup>            | $V_{SD}$      | $I_{SD}=10A, V_{GS}=0V$                                  |     |      | 1.2       | V          |
| Reverse Recovery Time                             | $t_{rr}$      | $I_F=I_S, di/dt=100A/\mu s$                              |     | 29   |           | ns         |
| Reverse Recovery Charge                           | $Q_{rr}$      |  |     |      | 130       |            |

Note 3. Pulse Test : Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .

4. Guaranteed by Design, Not Subject to Production Testing.

**Curve Characteristics**

Fig. 1 - Typical Output Characteristics

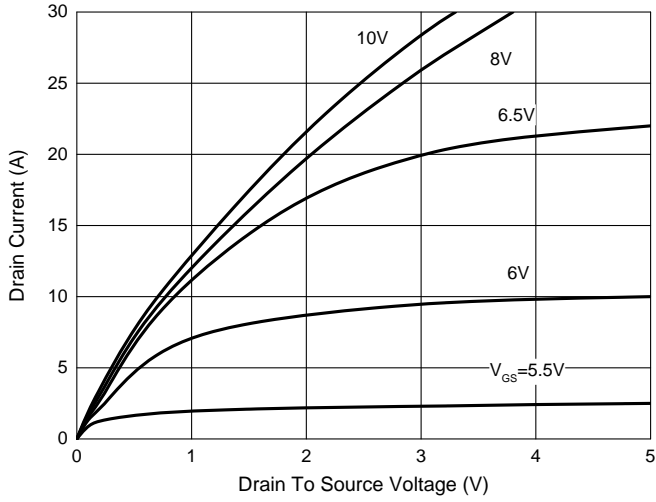


Fig. 2 - Transfer Characteristics

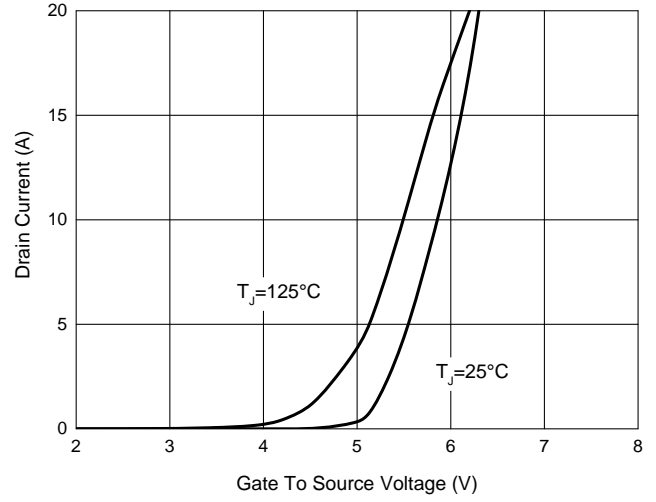


Fig. 3 - Capacitance Characteristics

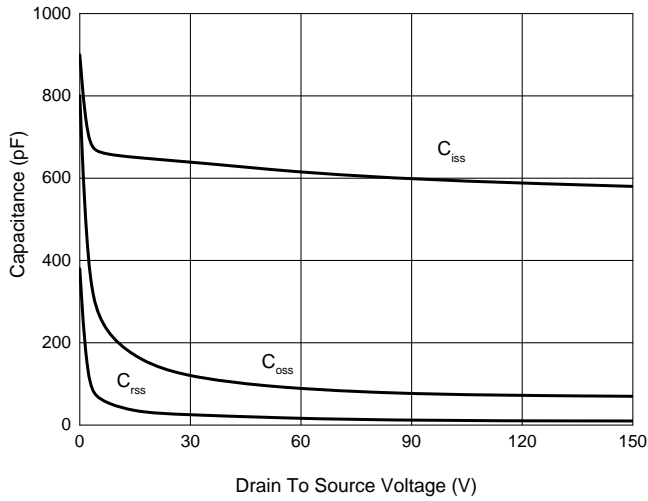


Fig. 4 - Gate Charge Characteristics

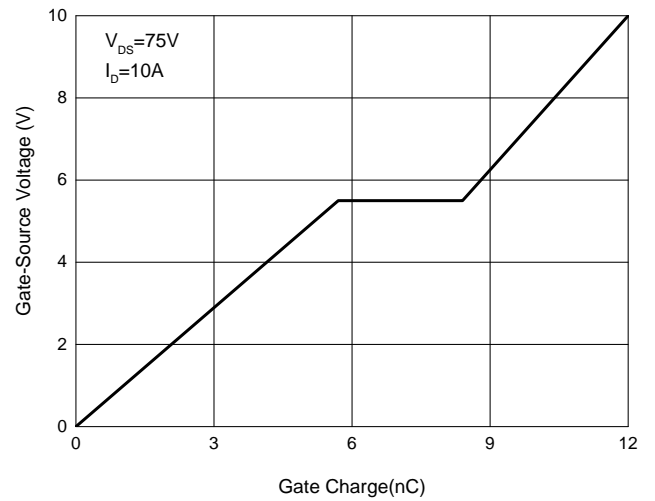


Fig. 5 -  $R_{DS(ON)} - I_D$

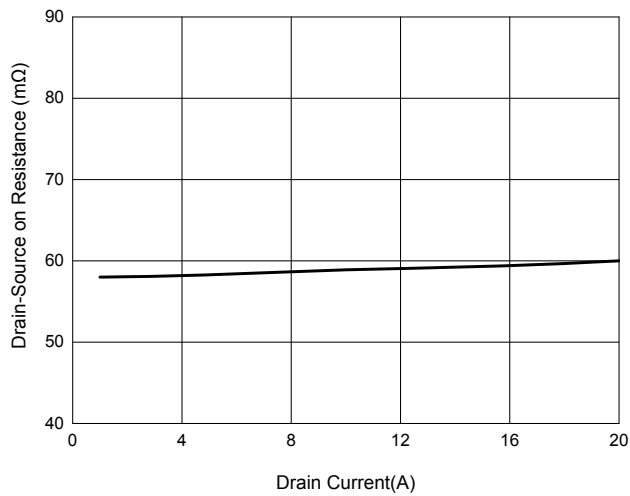
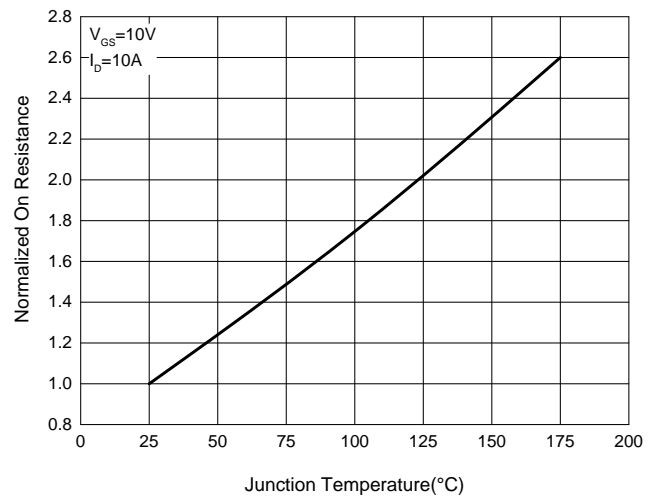


Fig. 6 - Normalized On Resistance Characteristics



## Ordering Information

| Device         | Packing                 |
|----------------|-------------------------|
| Part Number-TP | Tape&Reel: 2.5Kpcs/Reel |

Note : Adding "-HF" Suffix for Halogen Free, eg. Part Number-TP-HF

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