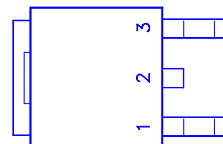
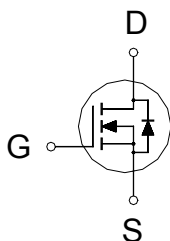


PRODUCT SUMMARY

| | | |
|---------------|--------------|-------|
| $V_{(BR)DSS}$ | $R_{DS(ON)}$ | I_D |
| 25 | 50mΩ | 12A |



- 1. GATE
- 2. DRAIN
- 3. SOURCE

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ABSOLUTE MAXIMUM RATINGS ($T_C = 25\text{ °C}$ Unless Otherwise Noted)

| PARAMETERS/TEST CONDITIONS | | SYMBOL | LIMITS | UNITS |
|--|-----------------------|----------------|------------|-------|
| Gate-Source Voltage | | V_{GS} | ±20 | V |
| Continuous Drain Current | $T_C = 25\text{ °C}$ | I_D | 12 | A |
| | $T_C = 100\text{ °C}$ | | 8 | |
| Pulsed Drain Current ¹ | | I_{DM} | 45 | |
| Avalanche Energy | $L = 0.1\text{mH}$ | E_{AS} | 60 | mJ |
| Repetitive Avalanche Energy ² | $L = 0.05\text{mH}$ | E_{AR} | 3 | |
| Power Dissipation | $T_C = 25\text{ °C}$ | P_D | 48 | W |
| | $T_C = 100\text{ °C}$ | | 20 | |
| Operating Junction & Storage Temperature Range | | T_j, T_{stg} | -55 to 150 | °C |
| Lead Temperature (¹ / ₁₆ " from case for 10 sec.) | | T_L | 275 | |

THERMAL RESISTANCE RATINGS

| THERMAL RESISTANCE | SYMBOL | TYPICAL | MAXIMUM | UNITS |
|---------------------|-----------------|---------|---------|--------|
| Junction-to-Case | $R_{\theta JC}$ | | 3 | °C / W |
| Junction-to-Ambient | $R_{\theta JA}$ | | 75 | |
| Case-to-Heatsink | $R_{\theta CS}$ | 1 | | |

¹Pulse width limited by maximum junction temperature.

²Duty cycle ≤ 1%

ELECTRICAL CHARACTERISTICS ($T_C = 25\text{ °C}$, Unless Otherwise Noted)

| PARAMETER | SYMBOL | TEST CONDITIONS | LIMITS | | | UNIT |
|-------------------------------------|---------------|--|--------|-----|------|------|
| | | | MIN | TYP | MAX | |
| STATIC | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$ | 25 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu A$ | 0.8 | 1.2 | 2.5 | |
| Gate-Body Leakage | I_{GSS} | $V_{DS} = 0V, V_{GS} = \pm 20V$ | | | ±250 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 20V, V_{GS} = 0V$ | | | 25 | μA |
| | | $V_{DS} = 20V, V_{GS} = 0V, T_J = 125\text{ °C}$ | | | 250 | |
| On-State Drain Current ¹ | $I_{D(ON)}$ | $V_{DS} = 10V, V_{GS} = 10V$ | 12 | | | A |

| | | | | | |
|---|---------------|--|-------|-----|------------|
| Drain-Source On-State Resistance ¹ | $R_{DS(ON)}$ | $V_{GS} = 5V, I_D = 12A$ | 70 | 115 | m Ω |
| | | $V_{GS} = 10V, I_D = 12A$ | 48 | 85 | |
| Forward Transconductance ¹ | g_{fs} | $V_{DS} = 15V, I_D = 12A$ | 16 | | S |
| DYNAMIC | | | | | |
| Input Capacitance | C_{iss} | $V_{GS} = 0V, V_{DS} = 15V, f = 1MHz$ | 450 | | pF |
| Output Capacitance | C_{oss} | | 200 | | |
| Reverse Transfer Capacitance | C_{rss} | | 60 | | |
| Total Gate Charge ² | Q_g | $V_{DS} = 0.5V_{(BR)DSS}, V_{GS} = 10V,$ $I_D = 6A$ | 15 | | nC |
| Gate-Source Charge ² | Q_{gs} | | 2.0 | | |
| Gate-Drain Charge ² | Q_{gd} | | 7.0 | | |
| Turn-On Delay Time ² | $t_{d(on)}$ | $V_{DS} = 15V, R_L = 1\Omega$ $I_D \cong 12A, V_{GS} = 10V, R_{GS} = 2.5\Omega$ | 6.0 | | nS |
| Rise Time ² | t_r | | 6.0 | | |
| Turn-Off Delay Time ² | $t_{d(off)}$ | | 20 | | |
| Fall Time ² | t_f | | 5.0 | | |
| SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ($T_c = 25^\circ C$) | | | | | |
| Continuous Current | I_S | | | 12 | A |
| Pulsed Current ³ | I_{SM} | | | 20 | |
| Forward Voltage ¹ | V_{SD} | $I_F = I_S, V_{GS} = 0V$ | | 1.5 | V |
| Reverse Recovery Time | t_{rr} | $I_F = I_S, di_F/dt = 100A / \mu S$ | 30 | | nS |
| Peak Reverse Recovery Current | $I_{RM(REC)}$ | | 15 | | A |
| Reverse Recovery Charge | Q_{rr} | | 0.043 | | μC |

¹Pulse test : Pulse Width $\leq 300 \mu sec$, Duty Cycle $\leq 2\%$.

²Independent of operating temperature.

³Pulse width limited by maximum junction temperature.

REMARK: THE PRODUCT MARKED WITH "P3057LD", DATE CODE or LOT #

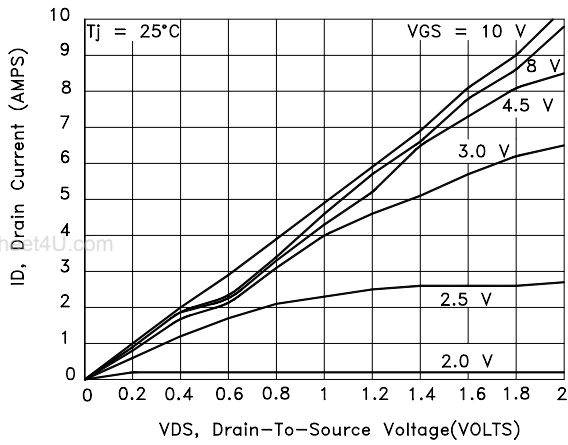


Fig.1 On-Resistance Variation with Temperature

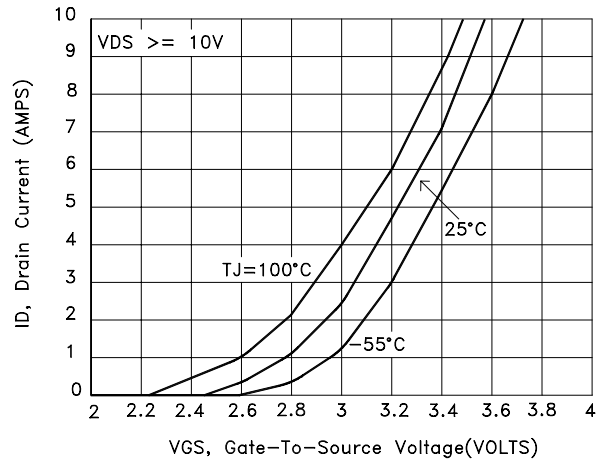


Fig.2 Transfer Characteristics

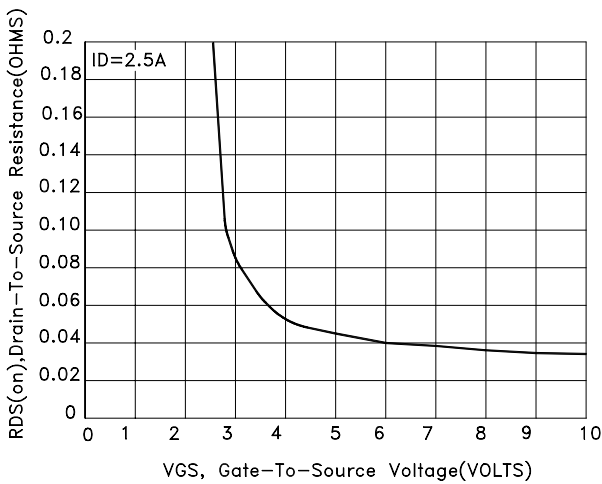


Fig.3 On-Resistance versus Gate-To-Source Voltage

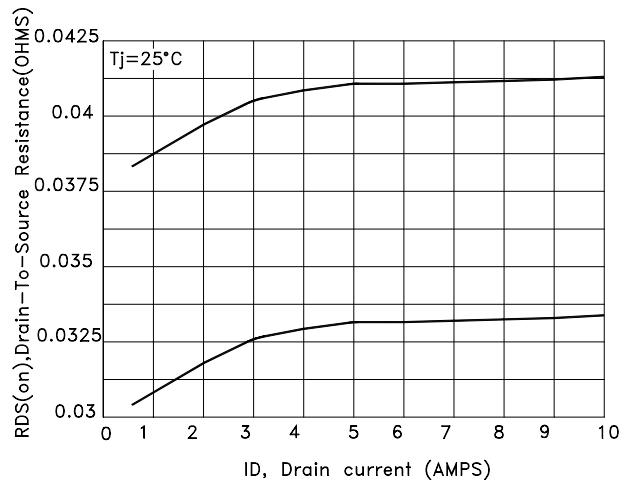


Fig.4 On-Resistance versus Drain Current and Gate Voltage

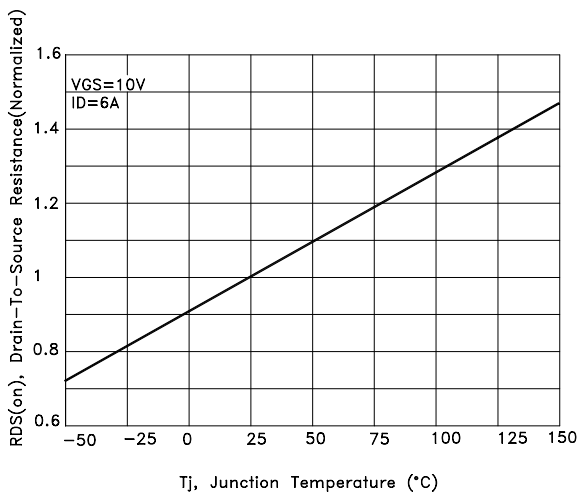


Fig.5 On-Resistance Variation with Temperature

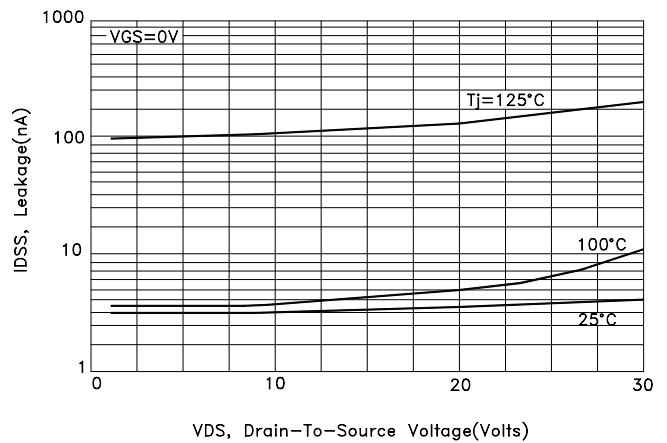


Fig.6 Drain-To-Source Leakage Current versus Voltage

TO-252 (DPAK) MECHANICAL DATA

| Dimension | mm | | | Dimension | mm | | |
|-----------|------|------|-------|-----------|------|------|------|
| | Min. | Typ. | Max. | | Min. | Typ. | Max. |
| A | 9.35 | | 10.10 | H | | 0.80 | |
| B | 2.20 | | 2.40 | I | 6.40 | | 6.60 |
| C | 0.48 | | 0.85 | J | 5.00 | | 5.50 |
| D | 0.89 | | 1.50 | K | 0.55 | | 1.10 |
| E | 0.45 | | 0.60 | L | 0.60 | | 1.00 |
| F | 0.03 | | 0.23 | M | 4.40 | | 4.60 |
| G | 5.20 | | 6.20 | N | | | |

