

Features

- Trench Power LV MOSFET Technology
- Excellent Package for Heat Dissipation
- High Density Cell Desihn for Low $R_{DS(on)}$
- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensivity 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: 5°C/W Junction to Case ^(Note 1)

| Parameter | Symbol | Rating | Unit | |
|---|----------|-------------------------|------|---|
| Drain-Source Voltage | V_{DS} | 20 | V | |
| Gate-Source Voltlage | V_{GS} | ±10 | V | |
| Continuous Drain Current | I_D | $T_C=25^\circ\text{C}$ | 30 | A |
| | | $T_C=100^\circ\text{C}$ | 21 | A |
| Pulsed Drain Current ^(Note 2) | I_{DM} | 125 | A | |
| Single Pulse Avalanche Energy ^(Note 3) | E_{AS} | 100 | mJ | |
| Total Power Dissipation | P_D | $T_C=25^\circ\text{C}$ | 30 | W |
| | | $T_C=100^\circ\text{C}$ | 15 | W |

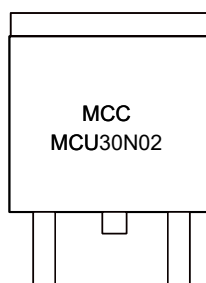
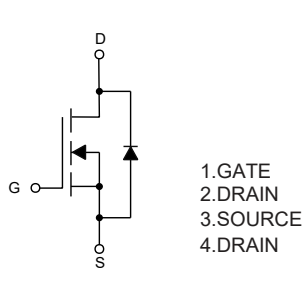
Note:

1. $R_{\theta JA}$ is the Sum of the Junction-to-Case and Case-to-Ambient Thermal Resistance, Where the Case Thermal Reference is Defined as the Solder Mounting Surface of the Drain Pins. $R_{\theta JC}$ is Guaranteed by Design, While $R_{\theta JA}$ is Determined by the Board Design. The Maximum Rating Presented Here is Based on Mounting on a 1 in² Pad of 2oz Copper.

2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

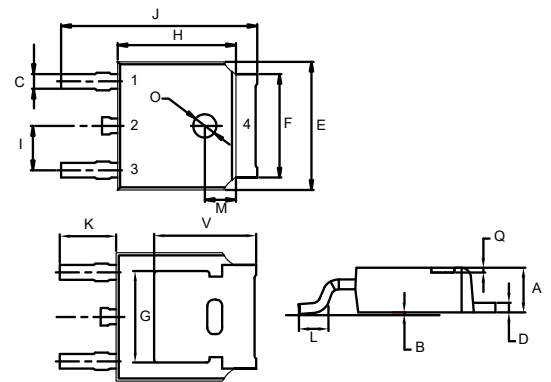
3. $T_J=25^\circ\text{C}$, $V_{DD}=20\text{V}$, $V_G=10\text{V}$, $L=0.5\text{mH}$, $R_g=25\Omega$

Internal Structure and Marking Code



N-CHANNEL MOSFET

DPAK



| DIM | INCHES | | MM | | NOTE |
|-----|--------|-------|------|-------|------|
| | 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 |
|---------------------------------|---------------|--|------|------|-----------|------------|
| Static Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$ | 20 | | | V |
| Gate-Source Leakage Current | I_{GSS} | $V_{DS}=0V, V_{GS}=\pm 10V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=20V, V_{GS}=0V$ | | | 1 | μA |
| Gate-Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 0.45 | 0.62 | 1 | V |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=4.5V, I_D=15A$ | | 5.6 | 7 | m Ω |
| | | $V_{GS}=2.5V, I_D=7A$ | | 7.1 | 9 | |
| | | $V_{GS}=1.8V, I_D=3A$ | | 10 | 14 | |
| Diode Forward Voltage | V_{SD} | $V_{GS}=0V, I_S=15A$ | | 0.9 | 1.2 | V |
| Continuous Body Diode Current | I_S | | | | 30 | A |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=10V, V_{GS}=0V, f=1MHz$ | | 1700 | | pF |
| Output Capacitance | C_{oss} | | | 305 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 145 | | |
| Total Gate Charge | Q_g | $V_{DS}=10V, V_{GS}=4.5V, I_D=15A$ | | 29 | | nC |
| Gate-Source Charge | Q_{gs} | | | 6 | | |
| Gate-Drain Charge | Q_{gd} | | | 7 | | |
| Reverse Recovery Charge | Q_{rr} | $I_S=15A, di/dt=100A/\mu s$ | | 23 | | |
| Reverse Recovery Time | t_{rr} | | | 39 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{GS}=4.5V, V_{DD}=10V, I_D=10A, R_L=1\Omega, R_{GEN}=3\Omega$ | | 7 | | ns |
| Turn-On Rise Time | t_r | | | 35 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 30 | | |
| Turn-Off Fall Time | t_f | | | 6 | | |

Curve Characteristics

Fig. 1 - Output Characteristics

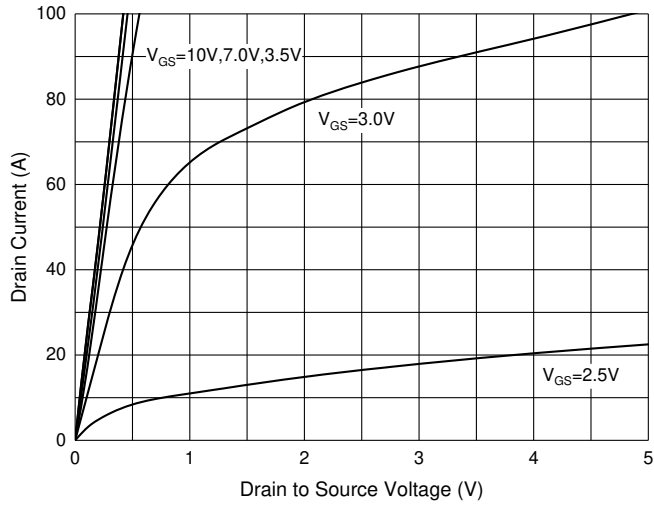


Fig. 2 - Transfer Characteristics

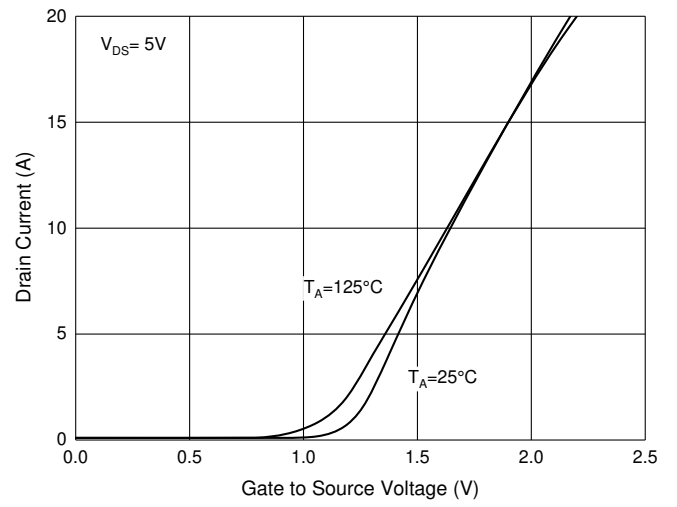


Fig. 3 - Capacitance Characteristics

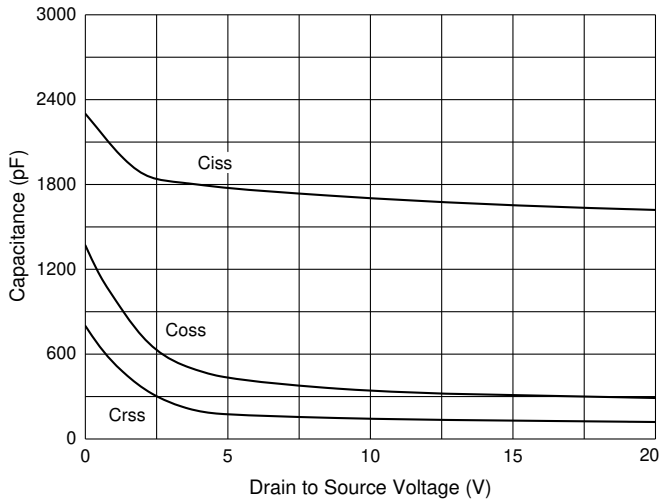


Fig. 4 - Gate Charge

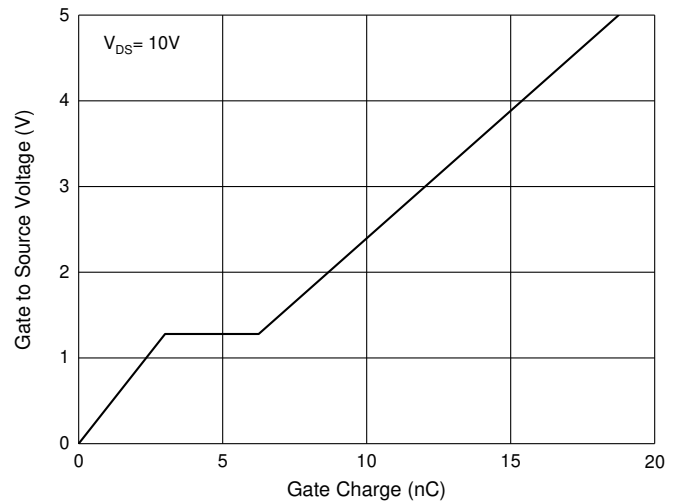


Fig. 5 - $R_{DS(ON)} - I_D$

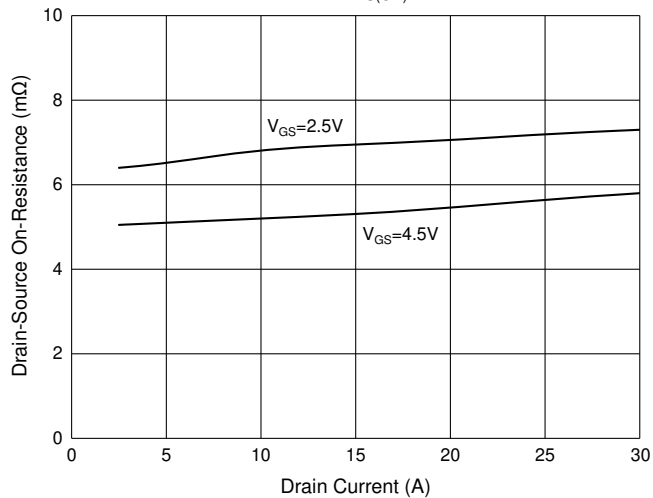
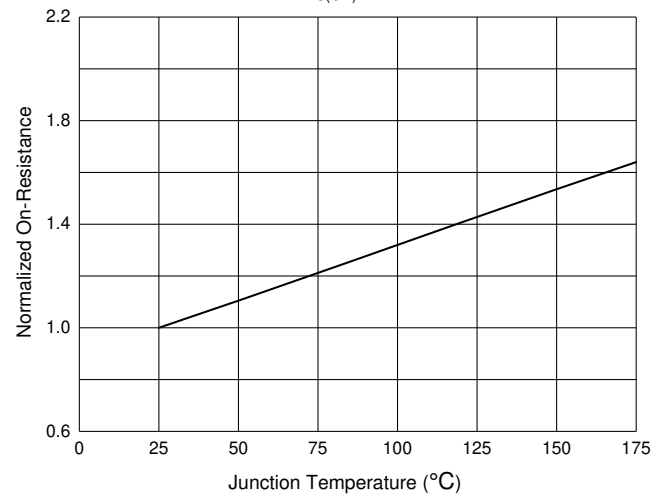


Fig. 6 - $R_{DS(ON)} - \text{Temperature}$



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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