

Features

- High Density Cell Design For Low $R_{DS(ON)}$
- Trench Power LV MOSFET Technology
- Excellent Package for Heat Dissipation
- 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
- Maximum Thermal Resistance: 7.5°C/W Junction to Case ^(Note1)

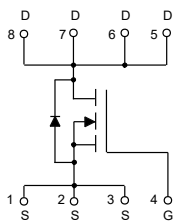
| Parameter | Symbol | Rating | Unit |
|--|----------|-------------------|------|
| Drain-Source Voltage | V_{DS} | 30 | V |
| Gate-Source Voltage | V_{GS} | ±20 | V |
| Continuous Drain Current | I_D | $T_C=25^\circ C$ | 30 |
| | | $T_C=100^\circ C$ | 21 |
| Pulsed Drain Current ^(Note2) | I_{DM} | 100 | A |
| Total Power Dissipation | P_D | $T_C=25^\circ C$ | 20 |
| | | $T_C=100^\circ C$ | 10 |
| Single Pulse Avalanche Energy ^(Note3) | E_{AS} | 128 | mJ |

Note 1. The Maximum Rating Presented Here is Based on Mounting on a 1in² Pad of 2oz Copper.

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

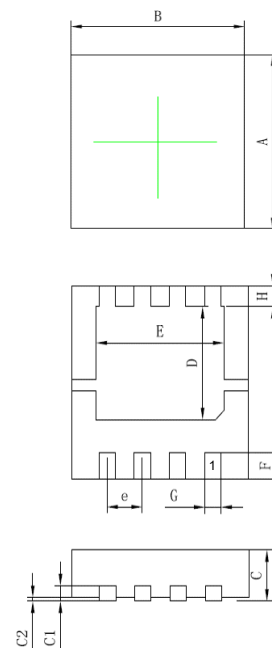
3. $T_J=25^\circ C$, $V_{DD}=20V$, $V_G=10V$, $L=0.5mH$, $R_g=25\Omega$

Internal Structure



N-CHANNEL MOSFET

DFN3333



| DIM | INCHES | | MM | | NOTE |
|-----|--------|-------|------|------|------|
| | MIN | MAX | MIN | MAX | |
| A | 0.70 | 0.75 | 17.8 | 19.0 | |
| B | 0.70 | 0.75 | 17.8 | 19.0 | |
| C | 0.08 | 0.09 | 2.0 | 2.3 | |
| ØF | 0.00 | 0.009 | 0.0 | 0.23 | |
| ØG | 0.00 | 0.009 | 0.0 | 0.23 | |
| Ø | 0.00 | 0.009 | 0.0 | 0.23 | |
| Ø | 0.00 | 0.009 | 0.0 | 0.23 | |
| Ø | 0.00 | 0.009 | 0.0 | 0.23 | |
| Ø | 0.00 | 0.009 | 0.0 | 0.23 | |
| Ø | 0.00 | 0.009 | 0.0 | 0.23 | |
| Ø | 0.00 | 0.009 | 0.0 | 0.23 | |
| P | 0.01G | 0.016 | 0.25 | 0.41 | |
| ^ | 0.024 | 0.028 | 0.61 | 0.71 | |

Electrical Characteristics @ 25°C (Unless Otherwise Specified)

| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|---------------------------------------|---------------|--|-----|------|-----------|------------|
| Static Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$ | 30 | | | V |
| Gate-Source Leakage Current | I_{GSS} | $V_{DS}=0V, V_{GS}=\pm 20V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=30V, V_{GS}=0V, T_J=25^\circ C$ | | | 1 | μA |
| | | $V_{DS}=30V, V_{GS}=0V, T_J=55^\circ C$ | | | 5 | |
| Gate-Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 1 | 1.5 | 2.5 | V |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=10V, I_D=15A$ | | 8 | 10 | m Ω |
| | | $V_{GS}=4.5V, I_D=15A$ | | 10 | 13 | |
| Diode Forward Voltage | V_{SD} | $V_{GS}=0V, I_S=15A$ | | 0.85 | 1.2 | V |
| Maximum Body-Diode Continuous Current | I_S | | | | 30 | A |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=15V, V_{GS}=0V, f=1MHz$ | | 1020 | | pF |
| Output Capacitance | C_{oss} | | | 225 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 126 | | |
| Switching Characteristics | | | | | | |
| Total Gate Charge | Q_g | $V_{DS}=15V, V_{GS}=10V, I_D=30A$ | | 28 | | nC |
| Gate-Source Charge | Q_{gs} | | | 7 | | |
| Gate-Drain Charge | Q_{gd} | | | 5 | | |
| Reverse Recovery Charge | Q_{rr} | $I_F=15A, di/dt=100A/\mu s$ | | 25 | | ns |
| Reverse Recovery Time | t_{rr} | | | 26 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{GS}=10V, V_{DS}=20V, I_D=2A, R_L=1\Omega, R_{GEN}=3\Omega$ | | 8 | | ns |
| Turn-On Rise Time | t_r | | | 15 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 27 | | |
| Turn-Off Fall Time | t_f | | | 7 | | |

Fig. 1 - Output Characteristics

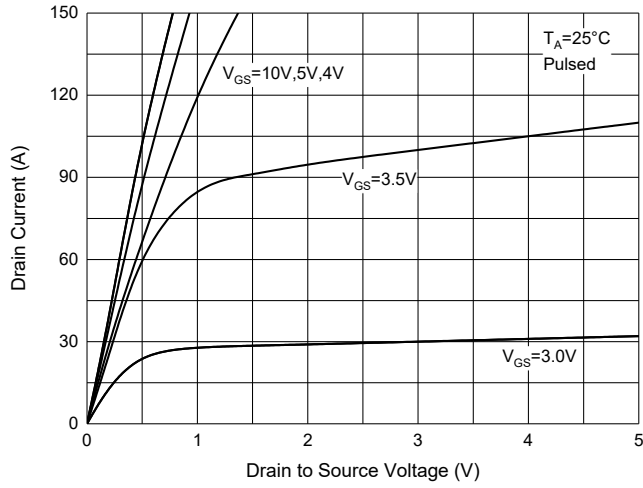


Fig. 2 - Transfer Characteristics

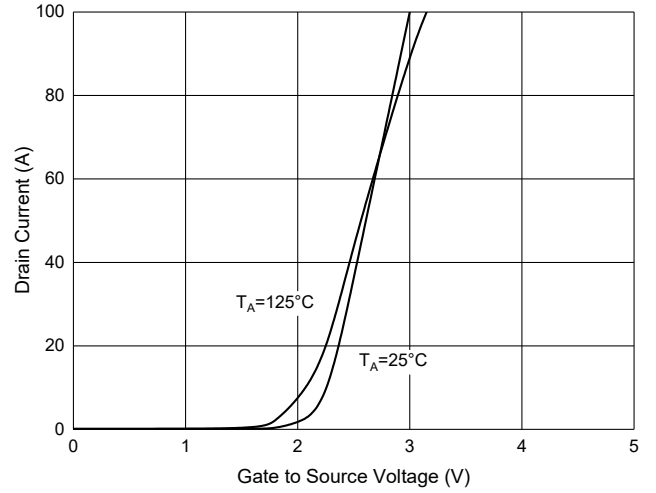


Fig. 3 - Capacitance Characteristics

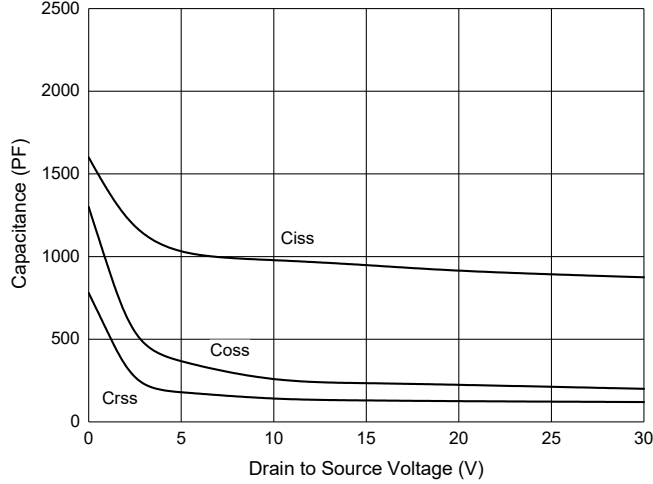


Fig. 4 - Gate Charge

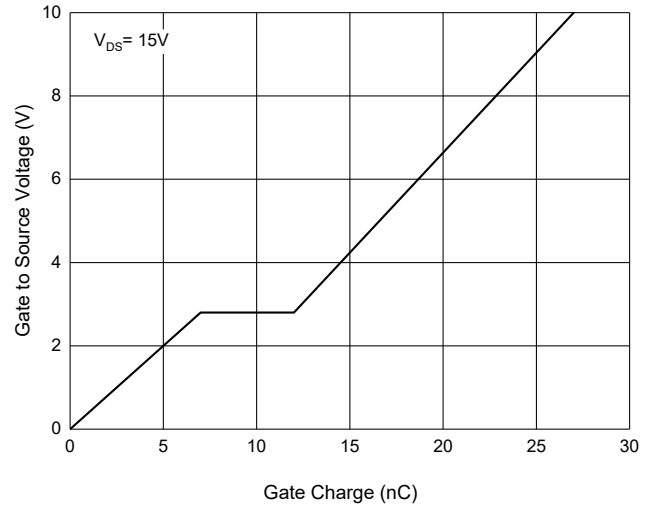


Fig. 5 - $R_{DS(ON)} - I_D$

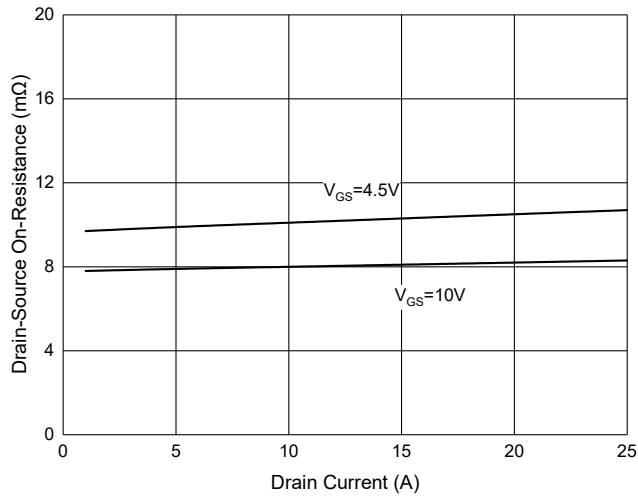
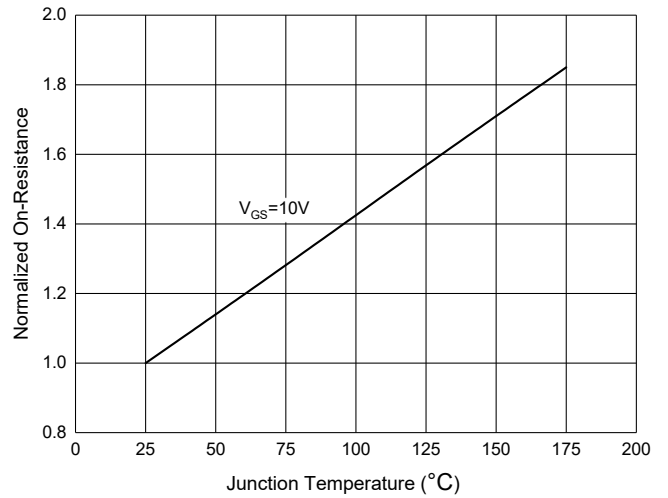


Fig. 6 - $R_{DS(ON)} - \text{Temperature}$



Ordering Information

| Device | Packing |
|----------------|-----------------------|
| Part Number-TP | Tape&Reel: 3Kpcs/Reel |

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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