

Features

- Split Gate Trench MOSFET Technology
- Excellent Package for Heat Dissipation
- High Density Cell Design for Low $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device (Note 1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

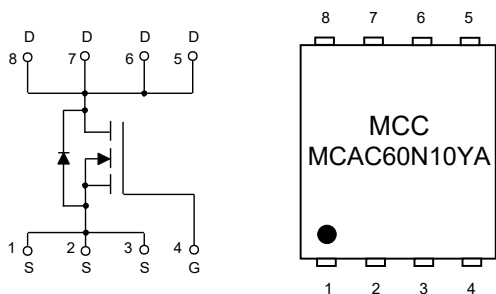
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 50°C/W Junction to Ambient(Steady-State)^(Note 2)
- Thermal Resistance: 1.42°C/W Junction to Case(Steady-State)

| Parameter | Symbol | Rating | Unit |
|--|----------|-------------------------|------|
| Drain-Source Voltage | V_{DS} | 100 | V |
| Gate-Source Voltage | V_{GS} | ±20 | V |
| Continuous Drain Current | I_D | $T_C=25^\circ\text{C}$ | 60 |
| | | $T_C=100^\circ\text{C}$ | 38 |
| Pulsed Drain Current ^(Note 3) | I_{DM} | 240 | A |
| Total Power Dissipation ^(Note 4) | P_D | 88 | W |
| Single Pulsed Avalanche Energy ^(Note 5) | E_{AS} | 200 | mJ |

Note:

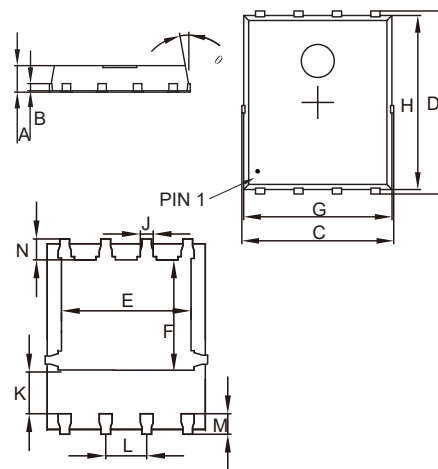
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$. The Power dissipation P_{DSM} is based on $R_{\theta JA} t \leq 10s$ and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
3. Repetitive rating; pulse width limited by max. junction temperature.
4. P_d is based on max. junction temperature, using junction-case thermal resistance.
5. $V_{DD}=50V$, $R_G=25\Omega$, $L=1mH$.

Internal Structure and Marking Code



N-CHANNEL MOSFET

DFN5060



| DIM | DIMENSIONS | | | | NOTE |
|-----|------------|-------|-------|------|------|
| | INCHES | | MM | | |
| | MIN | MAX | MIN | MAX | |
| A | 0.031 | 0.047 | 0.80 | 1.20 | |
| B | 0.010 | | 0.254 | | TYP. |
| C | 0.193 | 0.222 | 4.90 | 5.64 | |
| D | 0.232 | 0.250 | 5.90 | 6.35 | |
| E | 0.148 | 0.167 | 3.75 | 4.25 | |
| F | 0.126 | 0.154 | 3.20 | 3.92 | |
| G | 0.189 | 0.213 | 4.80 | 5.40 | |
| H | 0.222 | 0.239 | 5.65 | 6.06 | |
| K | 0.045 | 0.059 | 1.15 | 1.50 | |
| J | 0.012 | 0.020 | 0.30 | 0.50 | |
| L | 0.046 | 0.054 | 1.17 | 1.37 | |
| M | 0.012 | 0.028 | 0.30 | 0.71 | |
| N | 0.016 | 0.028 | 0.40 | 0.71 | |

Electrical Characteristics @ 25°C (Unless Otherwise Specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---------------------------------|---------------|--|-----|------|-----------|------------|
| Static Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$ | 100 | | | V |
| Gate-Source Leakage Current | I_{GSS} | $V_{DS}=0V, V_{GS}=\pm 20V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=100V, V_{GS}=0V$ | | | 1 | μA |
| Gate-Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 1.3 | 1.8 | 2.5 | V |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=10V, I_D=20A$ | | 7.5 | 8.6 | m Ω |
| | | $V_{GS}=4.5V, I_D=20A$ | | 9.5 | 13 | |
| Gate Resistance | R_G | f=1MHz, Open drain | | 0.85 | | Ω |
| Diode Characteristics | | | | | | |
| Continuous Body Diode Current | I_S | | | | 60 | A |
| Diode Forward Voltage | V_{SD} | $V_{GS}=0V, I_S=20A$ | | | 1.3 | V |
| Reverse Recovery Time | t_{rr} | $I_F=20A, dI_F/dt=100A/\mu s$ | | 53 | | ns |
| Reverse Recovery Charge | Q_{rr} | | | 67 | | nC |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=50V, V_{GS}=0V, f=1MHz$ | | 2330 | | pF |
| Output Capacitance | C_{oss} | | | 916 | | |
| Reverse Transfer Capacitance | C_{riss} | | | 17.6 | | |
| Total Gate Charge | Q_g | $V_{DS}=50V, V_{GS}=10V, I_D=25A$ | | 35 | | nC |
| Gate-Source Charge | Q_{gs} | | | 6.4 | | |
| Gate-Drain Charge | Q_{gd} | | | 5.8 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DS}=50V, V_{GEN}=10V, R_G=2.2\Omega, I_{DS}=25A$ | | 11 | | ns |
| Turn-On Rise Time | t_r | | | 4.7 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 27 | | |
| Turn-Off Fall Time | t_f | | | 5.6 | | |

Curve Characteristics

Fig. 1 - Typical Output Characteristics

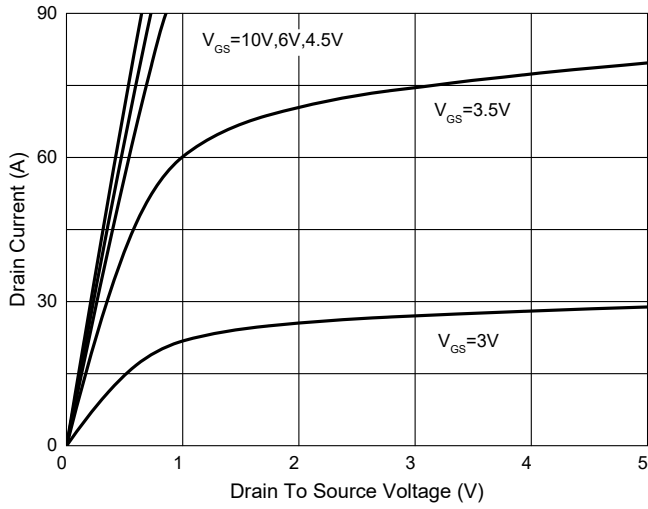


Fig. 2 - Transfer Characteristics

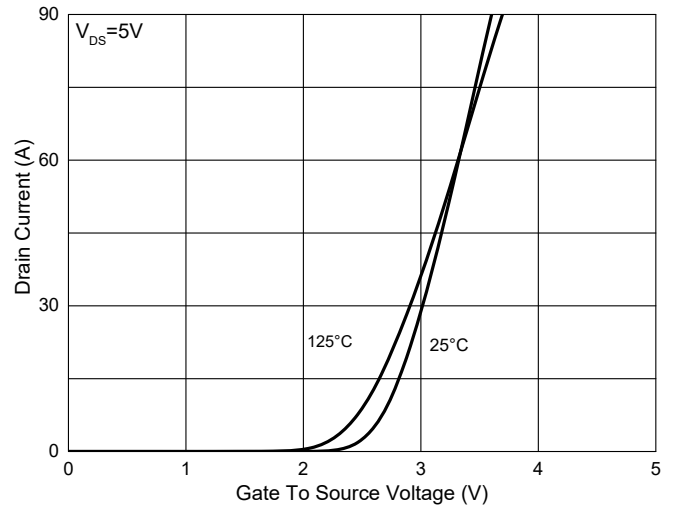


Fig. 3 - $R_{DS(ON)} - V_{GS}$

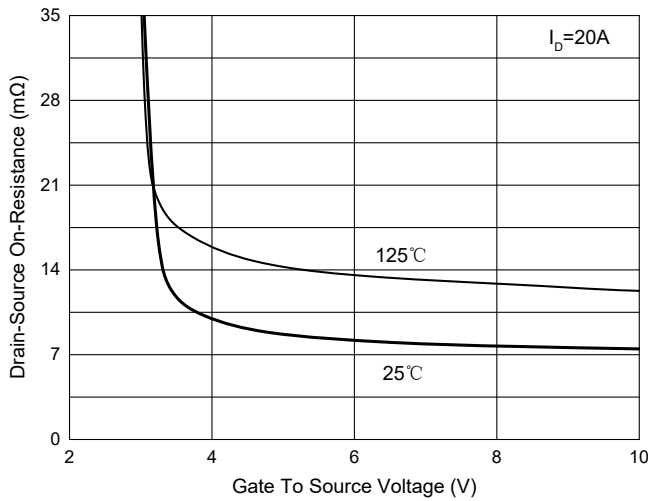


Fig. 4 - $R_{DS(ON)} - I_D$

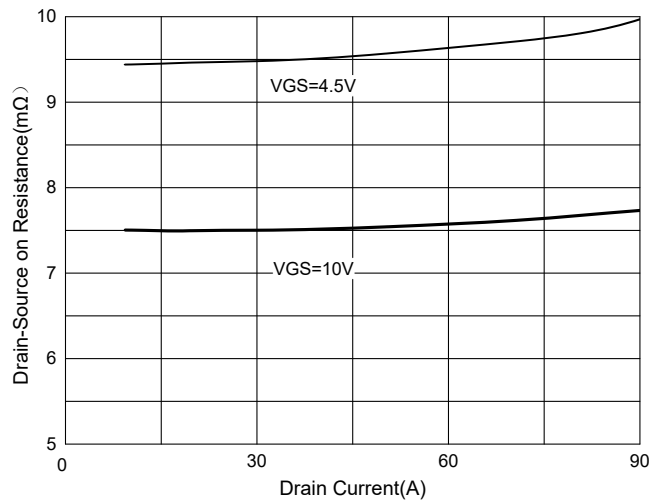


Fig. 5 - Capacitance Characteristics

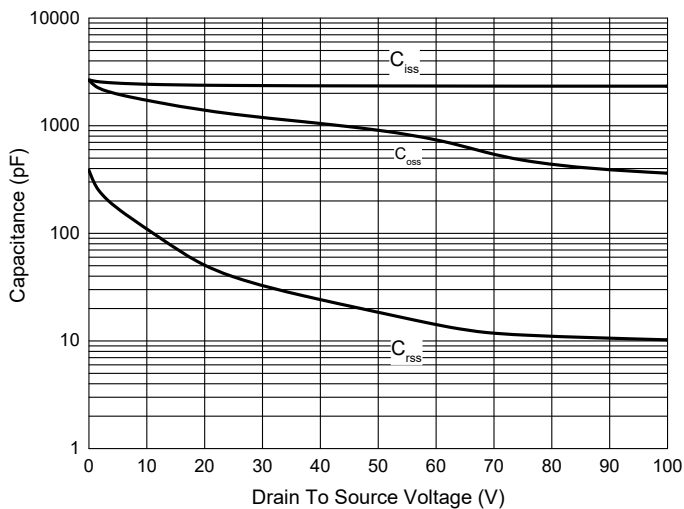
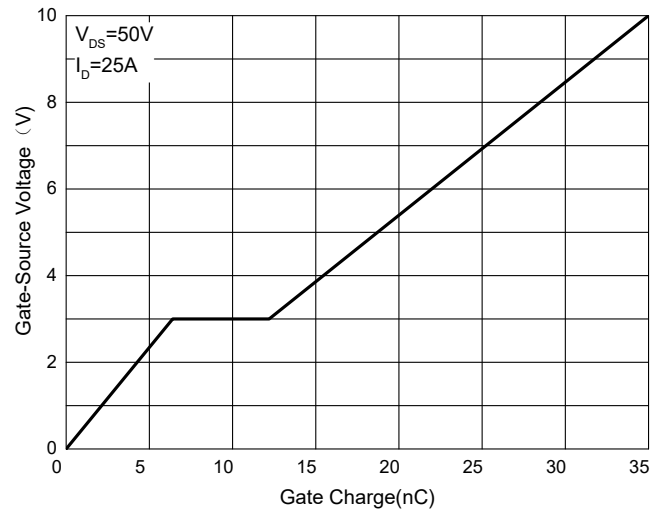


Fig. 6 - Gate Charge



Curve Characteristics

Fig. 7 - Normalized Threshold voltage

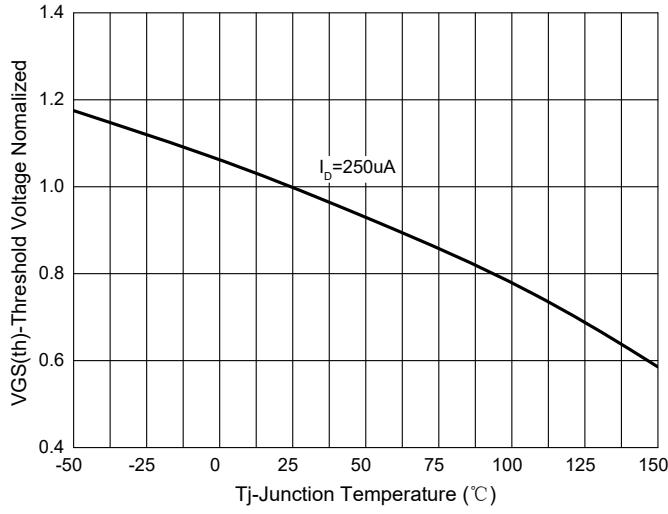


Fig.8-Normalized On Resistance Characteristics

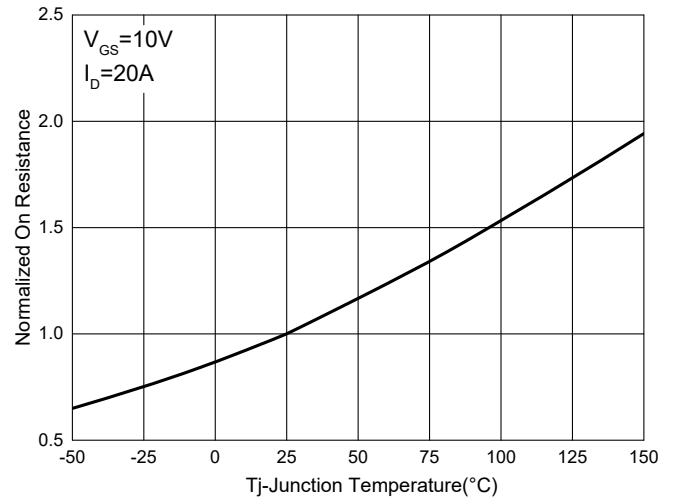


Fig.9 - $I_s - V_{SD}$

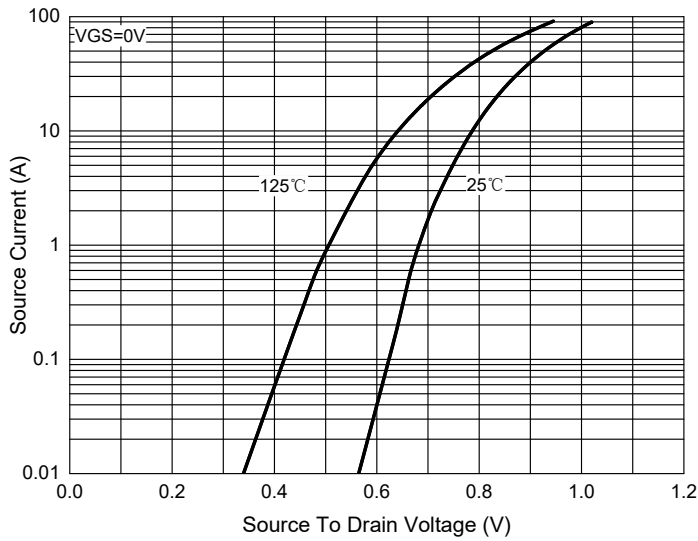


Fig. 10 - Drain Current

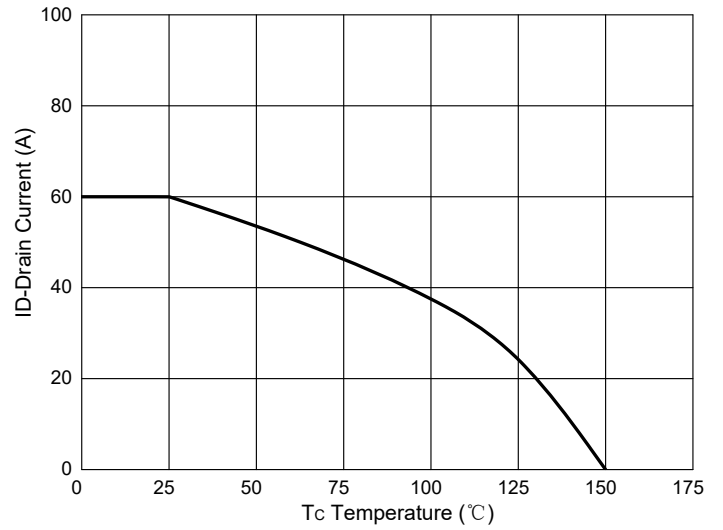
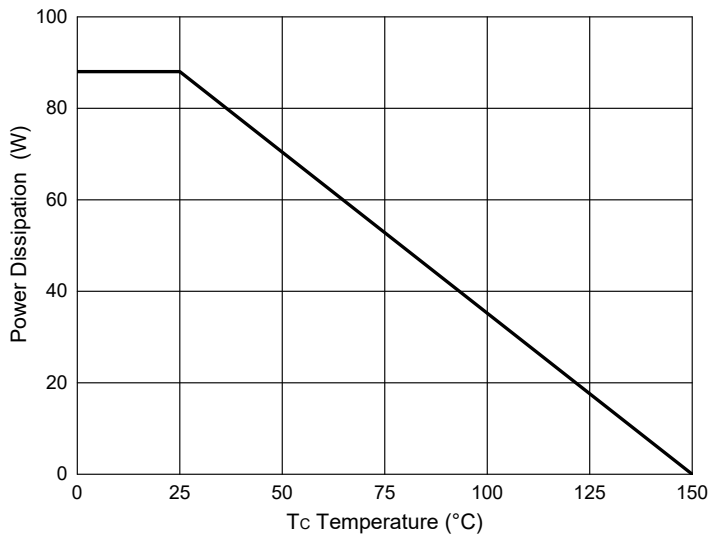


Fig.11-PD Dissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

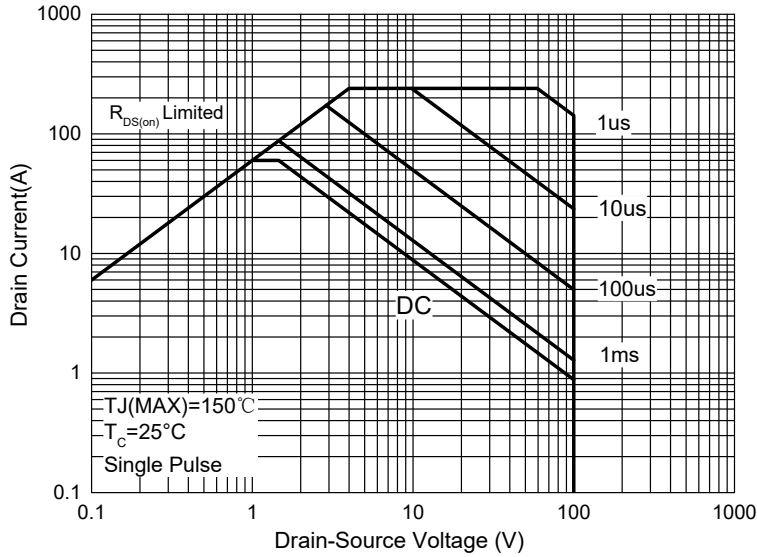
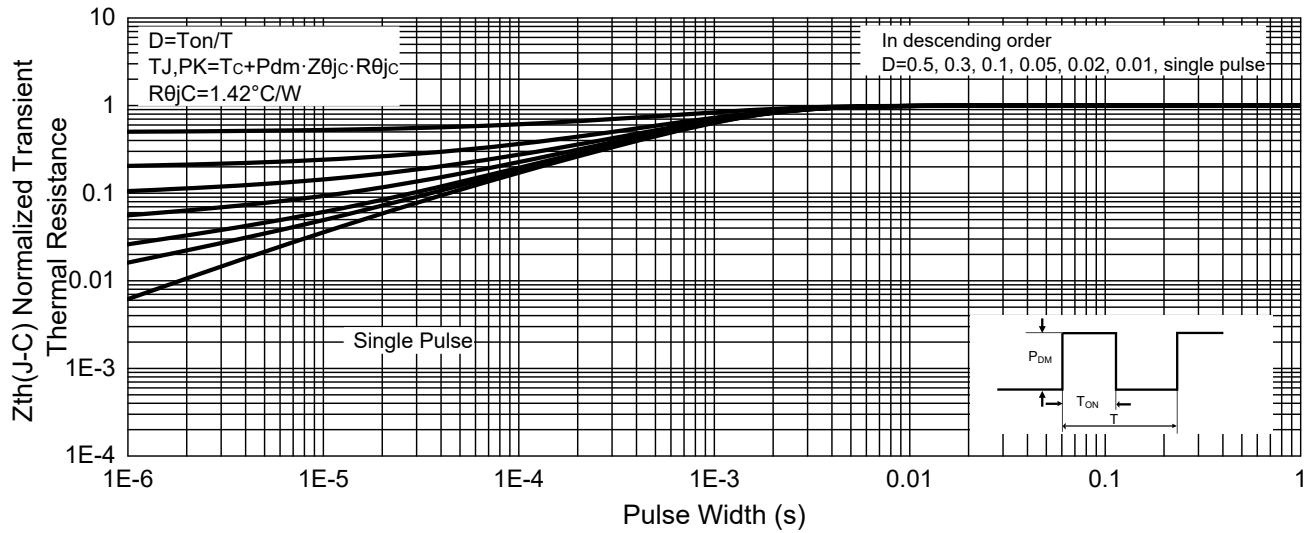


Fig. 13 - Normalized Transient Thermal Impedance



Ordering Information

| Device | Packing |
|----------------|-----------------------|
| Part Number-TP | Tape&Reel: 5Kpcs/Reel |

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