

Features

- Split Gate Trench MOSFET Technology
- Low Thermal Resistance
- Moisture Sensitivity Level 3
- Halogen Free. "Green" Device (Note1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

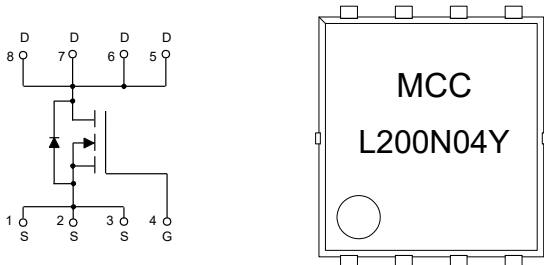
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 50°C/W Junction to Ambient (Note2)
- Thermal Resistance: 1.04°C/W Junction to Case

| Parameter | Symbol | Rating | Unit |
|---|----------|-------------------------|------|
| Drain-Source Voltage | V_{DS} | 40 | V |
| Gate-Source Voltage | V_{GS} | ±20 | V |
| Continuous Drain Current | I_D | $T_C=25^\circ\text{C}$ | 200 |
| | | $T_C=100^\circ\text{C}$ | 126 |
| Pulsed Drain Current (Note 3) | I_{DM} | 800 | A |
| Total Power Dissipation (Note 4) | P_D | 120 | W |
| Single Pulsed Avalanche Energy (Note 5) | E_{AS} | 625 | mJ |

Note:

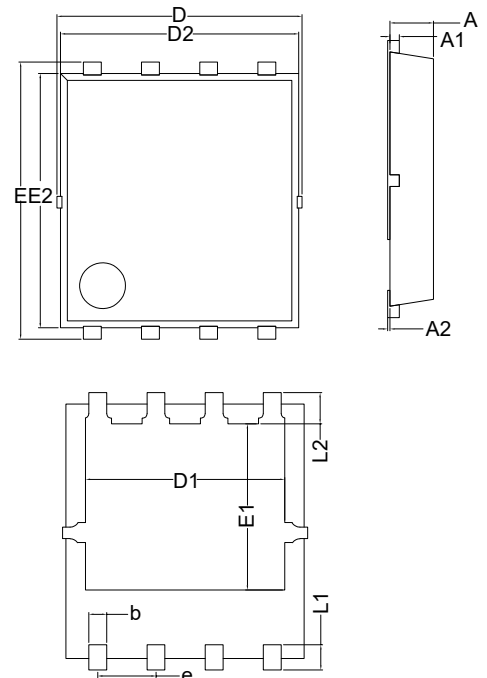
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$.
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. $T_J=25^\circ\text{C}$, $V_{DD}=30\text{V}$, $V_{GS}=10\text{V}$, $R_G=25\Omega$, $L=0.5\text{mH}$.

Internal Structure and Marking Code



N-CHANNEL MOSFET

DFN5060-C



| DIM | DIMENSIONS | | | | NOTE |
|-----|------------|-------|-------|------|------|
| | INCHES | | MM | | |
| | MIN | MAX | MIN | MAX | |
| D | 0.203 | 0.218 | 5.15 | 5.55 | |
| D2 | 0.201 | 0.209 | 5.10 | 5.30 | |
| E | 0.234 | 0.242 | 5.95 | 6.15 | |
| E2 | 0.215 | 0.222 | 5.45 | 5.65 | |
| A | 0.033 | 0.041 | 0.85 | 1.05 | |
| A1 | 0.008 | | 0.203 | | BSC |
| A2 | 0.000 | 0.004 | 0.00 | 0.10 | |
| D1 | 0.167 | 0.175 | 4.25 | 4.45 | |
| E1 | 0.139 | 0.147 | 3.52 | 3.73 | |
| L1 | 0.018 | 0.026 | 0.45 | 0.65 | |
| L2 | 0.027 | | 0.68 | | BSC |
| b | 0.012 | 0.020 | 0.30 | 0.50 | |
| e | 0.050 | | 1.27 | | BSC |

Electrical Characteristics @ 25°C (Unless Otherwise Specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---------------------------------|---------------|---|-----|-------|-----------|------------|
| Static Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$ | 40 | | | V |
| Gate-Source Leakage Current | I_{GSS} | $V_{DS}=0V, V_{GS}=\pm 20V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=40V, V_{GS}=0V$ | | | 1 | μA |
| Gate-Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 1.0 | 1.8 | 2.5 | V |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=10V, I_D=20A$ | | 1.1 | 1.35 | m Ω |
| | | $V_{GS}=4.5V, I_D=20A$ | | 1.5 | 2.1 | |
| Gate Resistance | R_g | f=1 MHz, Open drain | | 3 | | Ω |
| Diode Characteristics | | | | | | |
| Continuous Body Diode Current | I_S | | | | 200 | A |
| Diode Forward Voltage | V_{SD} | $V_{GS}=0V, I_S=20A$ | | | 1.3 | V |
| Reverse Recovery Time | t_{rr} | $I_F=20A, dI_F/dt=100A/\mu s$ | | 56 | | ns |
| Reverse Recovery Charge | Q_{rr} | | | 70 | | nC |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=25V, V_{GS}=0V, f=1MHz$ | | 6870 | | pF |
| Output Capacitance | C_{oss} | | | 1250 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 96 | | |
| Total Gate Charge | Q_g | $V_{DS}=20V, V_{GS}=10V, I_D=20A$ | | 112.7 | | nC |
| Gate-Source Charge | Q_{gs} | | | 15.8 | | |
| Gate-Drain Charge | Q_{gd} | | | 21 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}=20V, V_{GS}=10V, R_G=2.2\Omega, I_{DS}=20A$ | | 10 | | ns |
| Turn-On Rise Time | t_r | | | 14 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 108 | | |
| Turn-Off Fall Time | t_f | | | 50 | | |

Curve Characteristics

Fig. 1 - Typical Output Characteristics

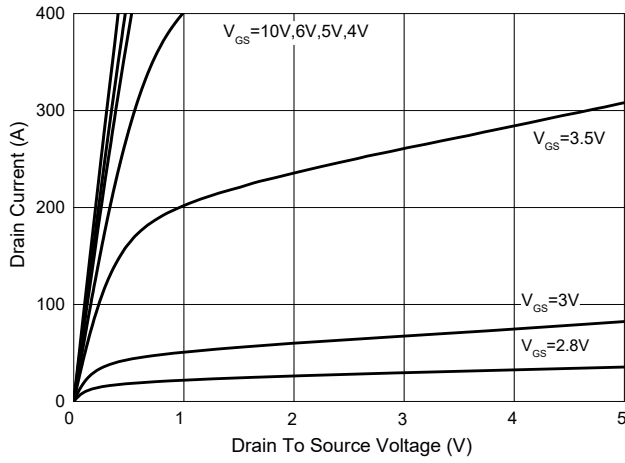


Fig. 2 - Transfer Characteristics

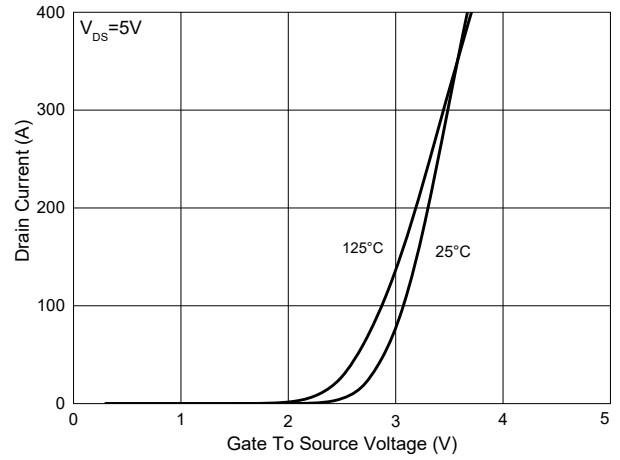


Fig.3 - $R_{DS(ON)}$ - V_{GS}

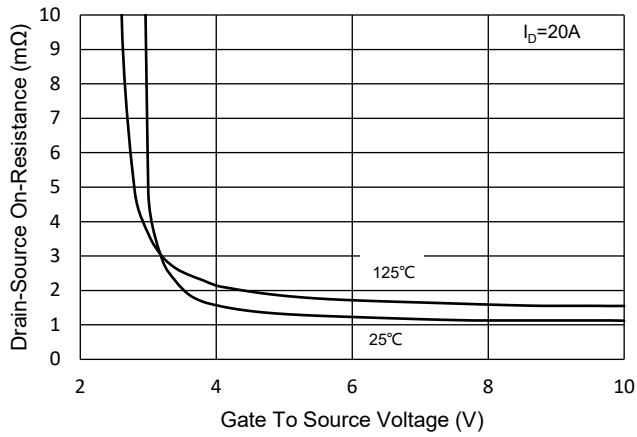


Fig. 4 - $R_{DS(ON)}$ - I_D

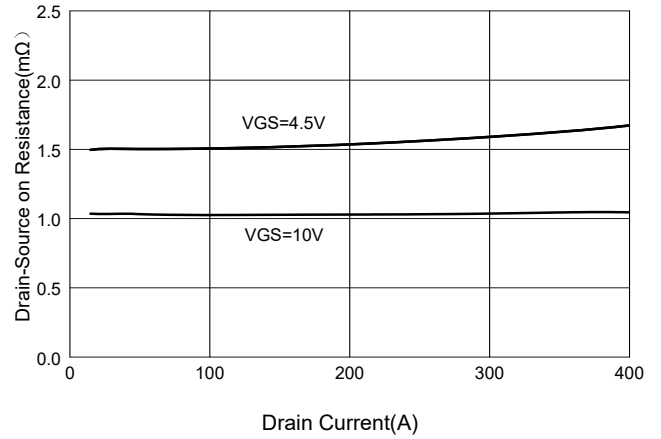


Fig.5 - Capacitance Characteristics

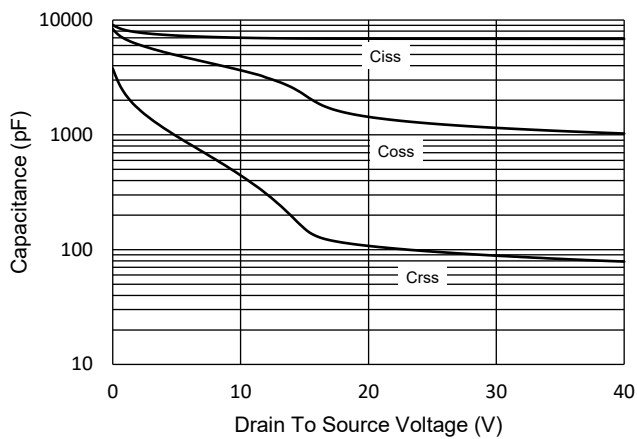
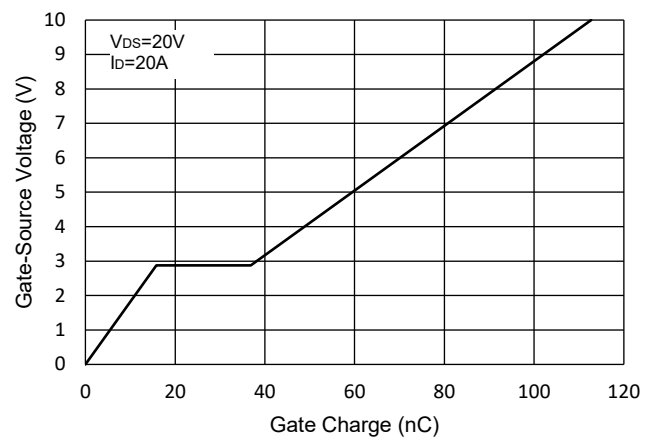


Fig.6 - Gate Charge



Curve Characteristics

Fig.7 - Normalized Threshold Voltage

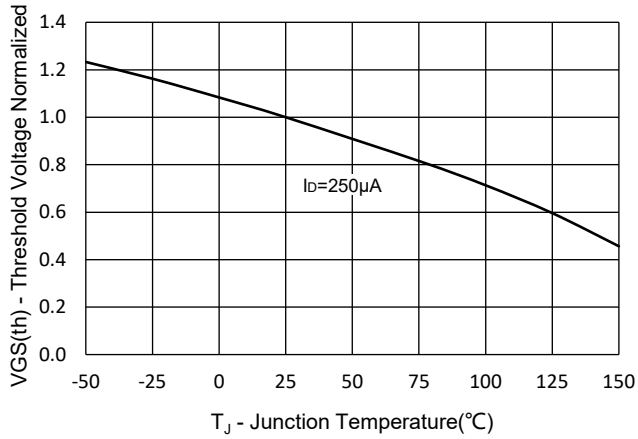


Fig.8 - Normalized On Resistance Characteristics

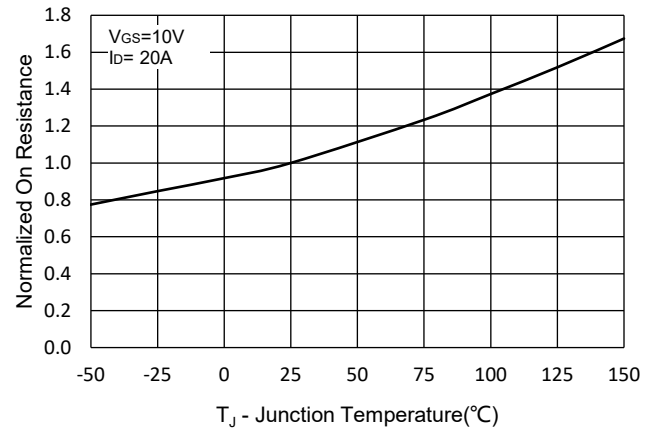


Fig.9 - I_S - V_{SD}

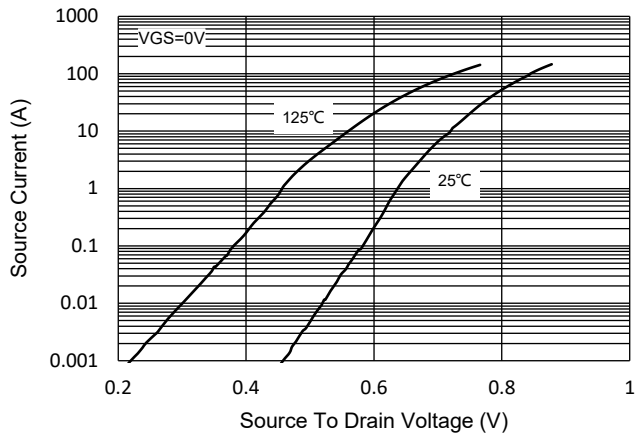


Fig.10 - Drain Current

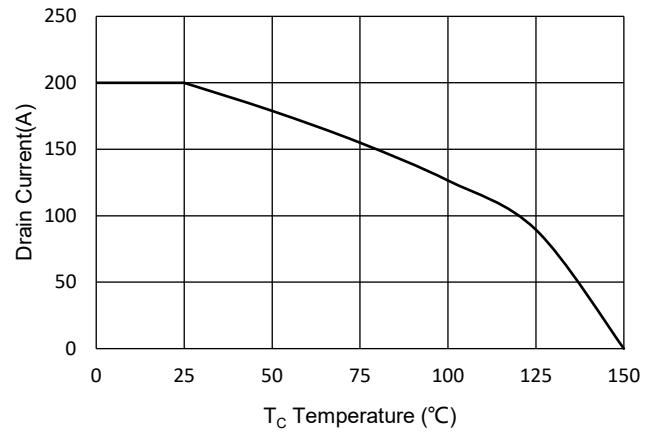
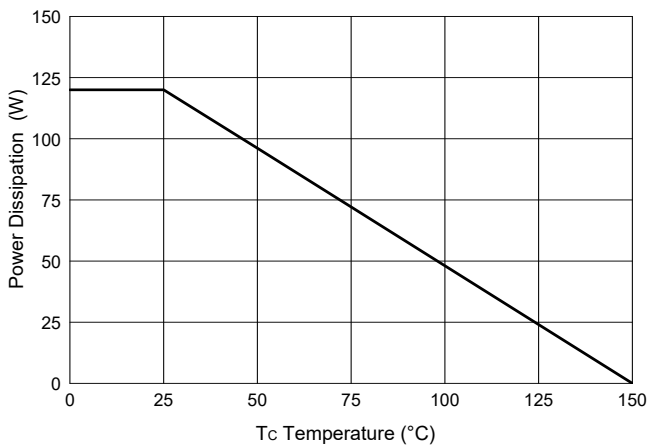


Fig.11-PD Dissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

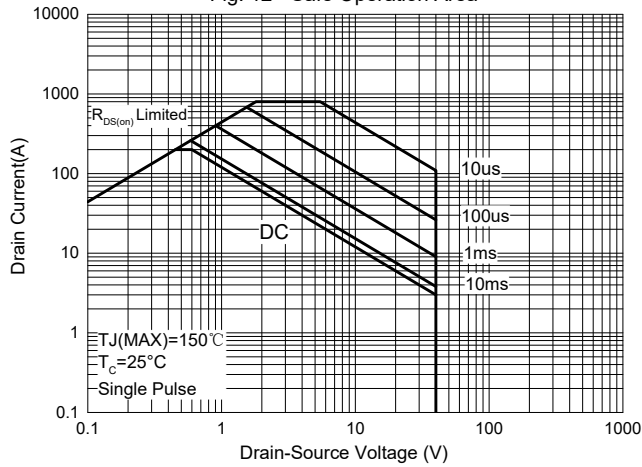
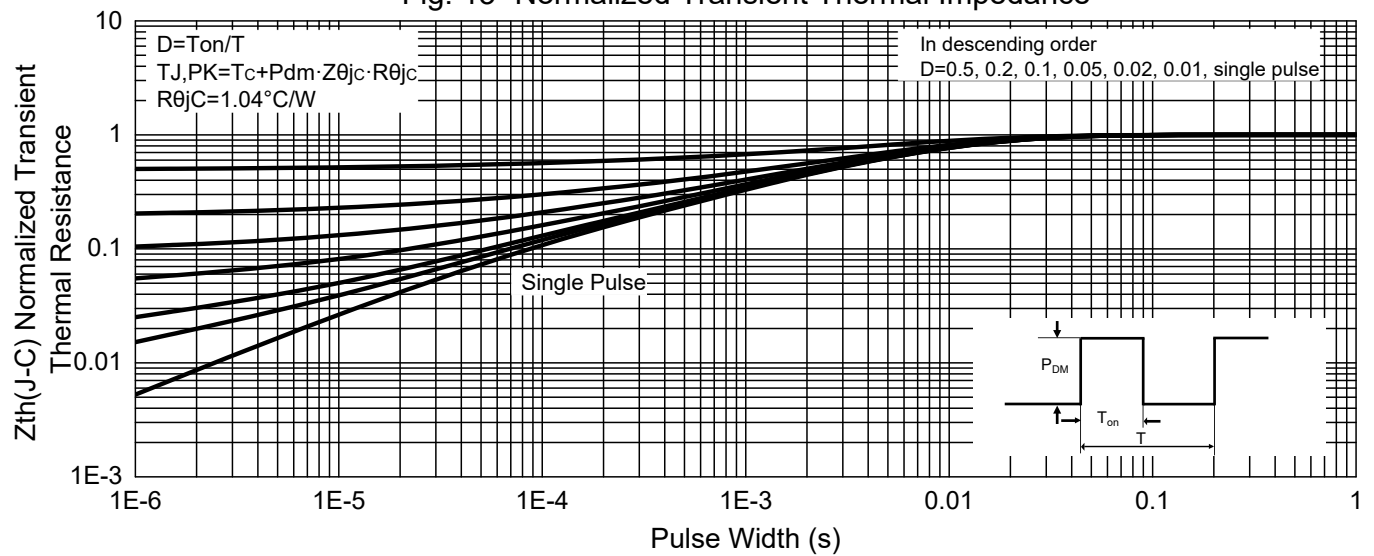


Fig. 13 - Normalized Transient Thermal Impedance



Ordering Information

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

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