

Features

- Trench Power LV MOSFET Technology
- Moisture Sensitivity Level 3
- 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

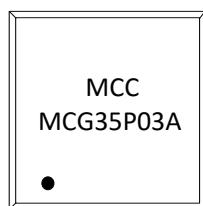
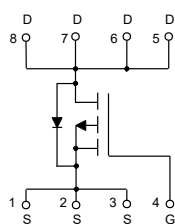
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 60°C/W Junction to Ambient (Note 2)
- Thermal Resistance: 2°C/W Junction to Case

| Parameter | Symbol | Rating | Unit |
|---|----------|-------------------------|------|
| Drain-Source Voltage | V_{DS} | -30 | V |
| Gate-Source Voltage | V_{GS} | ±20 | V |
| Continuous Drain Current | I_D | $T_C=25^\circ\text{C}$ | -35 |
| | | $T_C=100^\circ\text{C}$ | -22 |
| Pulsed Drain Current (Note 3) | I_{DM} | -140 | A |
| Total Power Dissipation (Note 4) | P_D | 62.5 | W |
| Single Pulsed Avalanche Energy (Note 5) | E_{AS} | 162 | 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. $T_J=25^\circ\text{C}$, $V_{DD}=-30\text{V}$, $V_{GS}=-10\text{V}$, $L=1\text{mH}$.

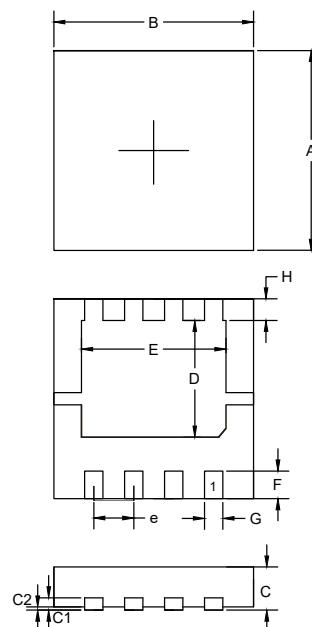
Internal Structure and Marking Code



pin1

P-CHANNEL MOSFET

DFN3333



| DIM | INCHES | | MM | | NOTE |
|-----|--------|-------|------|------|------|
| | MIN | MAX | MIN | MAX | |
| A | 0.126 | 0.130 | 3.20 | 3.30 | |
| B | 0.126 | 0.130 | 3.20 | 3.30 | |
| C | 0.030 | 0.033 | 0.75 | 0.85 | |
| C1 | 0.007 | 0.009 | 0.18 | 0.22 | |
| C2 | --- | 0.002 | --- | 0.05 | |
| D | 0.071 | 0.079 | 1.80 | 2.00 | |
| E | 0.087 | 0.098 | 2.20 | 2.50 | |
| F | 0.016 | 0.020 | 0.40 | 0.50 | |
| G | 0.010 | 0.014 | 0.25 | 0.35 | |
| H | 0.012 | 0.016 | 0.30 | 0.40 | |
| e | 0.024 | 0.028 | 0.60 | 0.70 | |

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} | $V_{DS}=-30V, V_{GS}=0V$ | | | -1 | μA |
| 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 | $R_{DS(on)}$ | $V_{GS}=-10V, I_D=-20A$ | | 6.7 | 9 | m Ω |
| | | $V_{GS}=-4.5V, I_D=-20A$ | | 9.2 | 13 | |
| Gate Resistance | R_g | f=1 MHz, Open drain | | 2.5 | | Ω |
| Diode Characteristics | | | | | | |
| Continuous Body Diode Current | I_S | | | | -35 | A |
| Diode Forward Voltage | V_{SD} | $V_{GS}=0V, I_S=-20A$ | | | -1.2 | V |
| Reverse Recovery Time | t_{rr} | $I_F=-17.5A, di_F/dt=100A/\mu s$ | | 20 | | ns |
| Reverse Recovery Charge | Q_{rr} | | | 10 | | nC |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=-15V, V_{GS}=0V, f=1MHz$ | | 2718 | | pF |
| Output Capacitance | C_{oss} | | | 323 | | |
| Reverse Transfer Capacitance | C_{riss} | | | 305 | | |
| Total Gate Charge | Q_g | $V_{DS}=-15V, V_{GS}=-10V, I_D=-17.5A$ | | 54 | | nC |
| Gate-Source Charge | Q_{gs} | | | 6.4 | | |
| Gate-Drain Charge | Q_{gd} | | | 11 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}=-15V, V_{GS}=-10V, R_G=6\Omega, I_{DS}=-17.5A$ | | 8.7 | | ns |
| Turn-On Rise Time | t_r | | | 10 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 69 | | |
| Turn-Off Fall Time | t_f | | | 32 | | |

Curve Characteristics

Fig.1 - Typical Output Characteristics

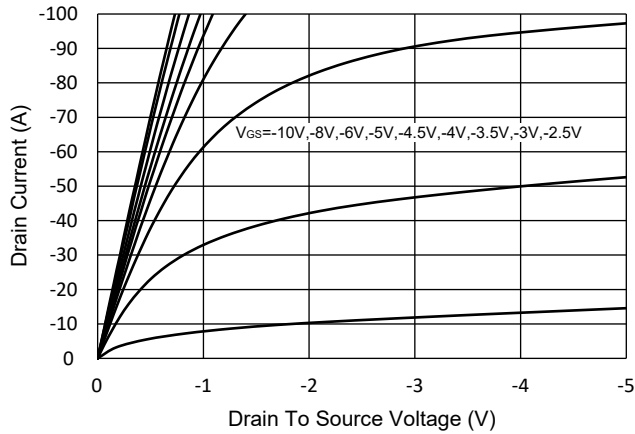


Fig.2 - Transfer Characteristic

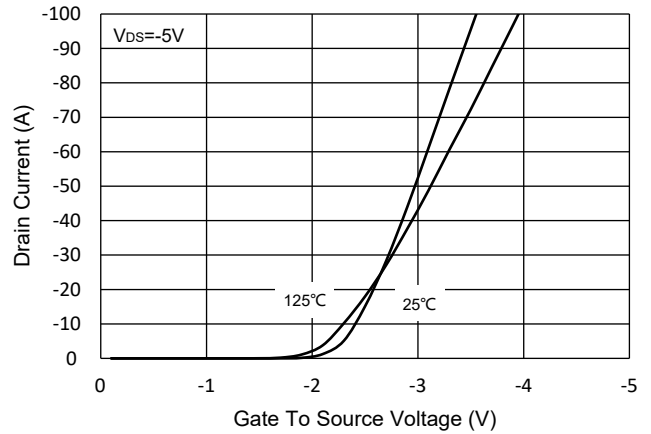


Fig.3 - $R_{DS(ON)}$ - V_{GS}

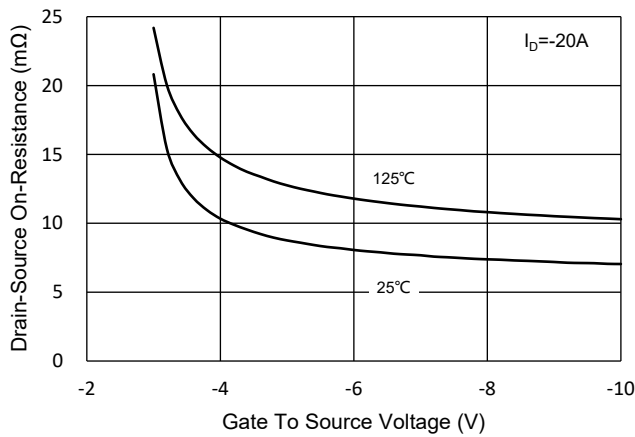


Fig.4 - $R_{DS(ON)}$ - I_D

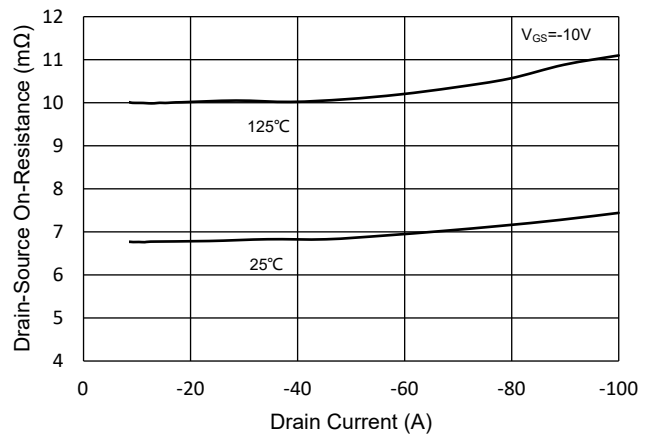


Fig.5 - Capacitance Characteristics

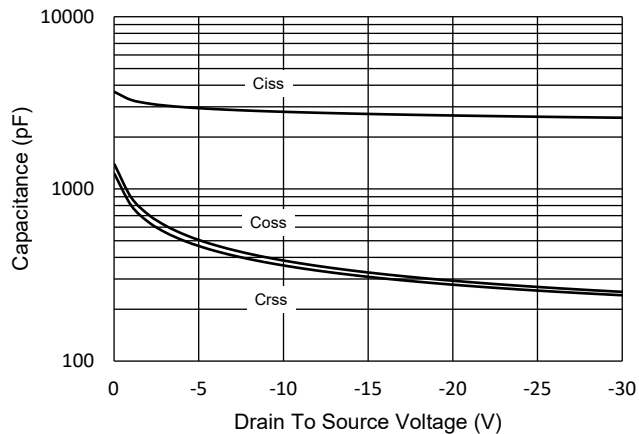
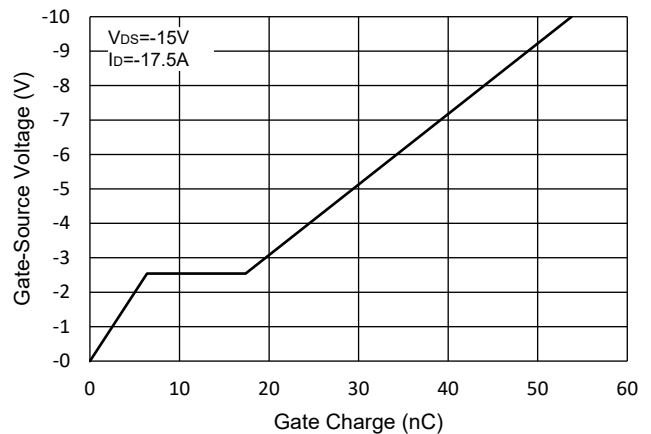


Fig.6 - Gate Charge



Curve Characteristics

Fig.7 - Normalized Threshold Voltage

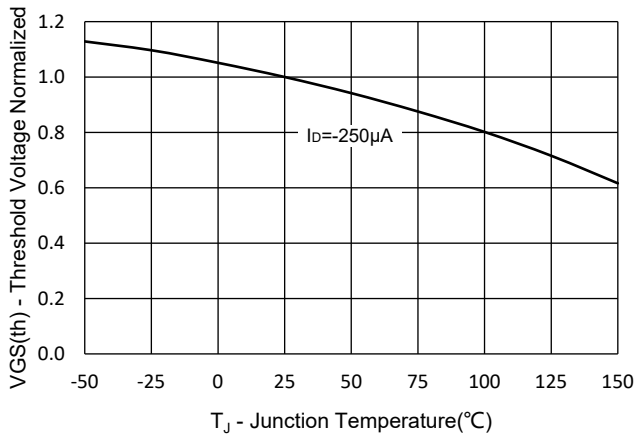


Fig.8 - Normalized On Resistance Characteristics

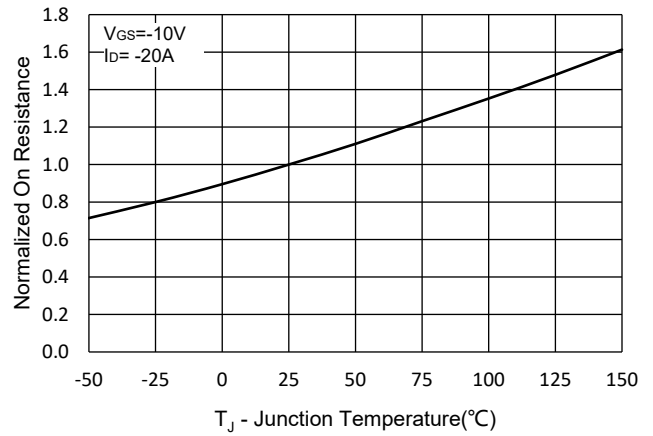


Fig.9 - I_s - V_{SD}

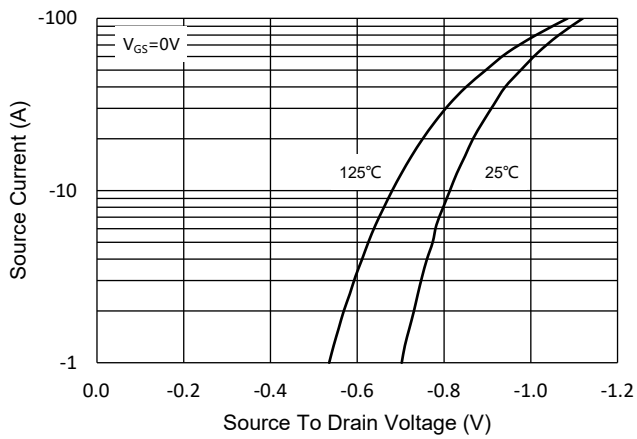


Fig.10 - Drain Current

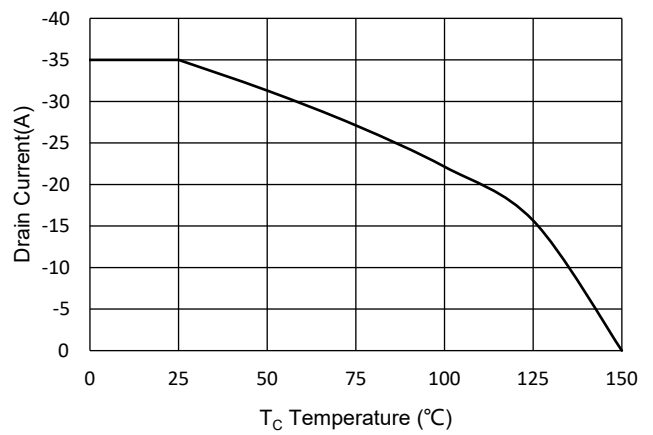
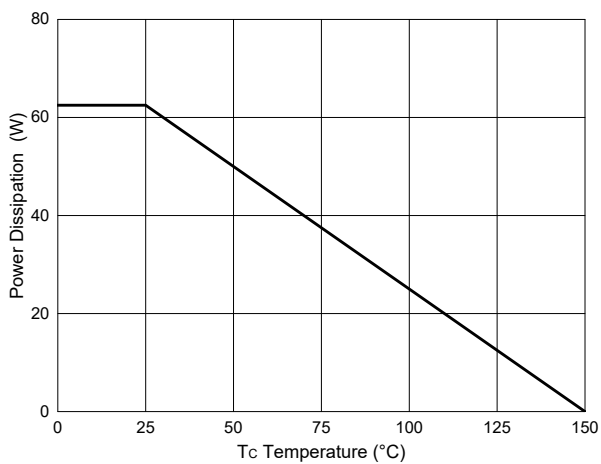


Fig.11 - PD Dissipation



Curve Characteristics

Fig.12 - Safe Operation Area

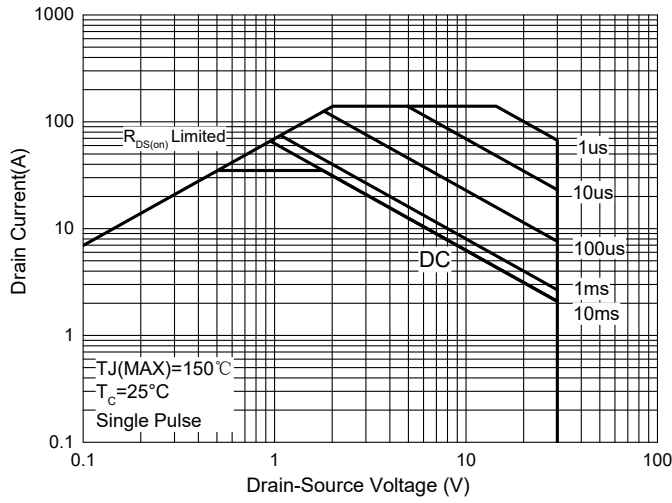
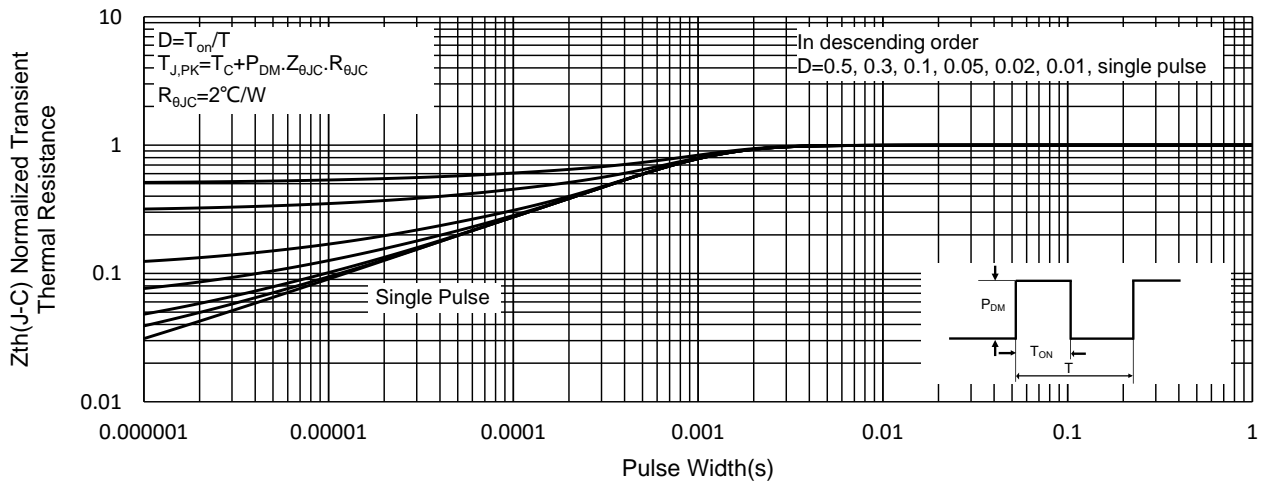


Fig.13 - Normalized Transient Thermal Impedance



Ordering Information

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

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