

Features

- Trench LV MOSFET Technology
- 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

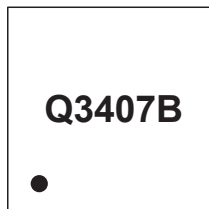
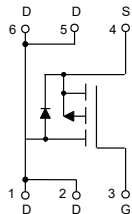
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 80°C/W Junction to Ambient^(Note2)
- Thermal Resistance: 8°C/W Junction to Case

| Parameter | Symbol | Rating | Unit |
|---|----------|-------------------------|------|
| Drain-Source Voltage | V_{DS} | -30 | V |
| Gate-Source Voltage | V_{GS} | ±20 | V |
| Continuous Drain Current | I_D | $T_C=25^\circ\text{C}$ | -10 |
| | | $T_C=100^\circ\text{C}$ | -6 |
| Pulsed Drain Current ^(Note 3) | I_{DM} | -40 | A |
| Total Power Dissipation ^(Note 4) | P_D | 15 | W |

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-ambient thermal resistance.

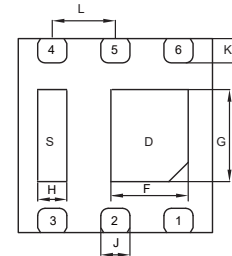
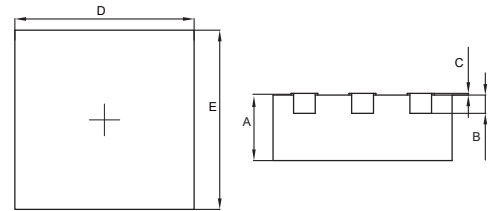
Internal Structure and Marking Code



Pin1

P-CHANNEL MOSFET

DFN2020-6LE



| DIM | INCHES | | MM | | NOTE |
|-----|--------|-------|-------|-------|------|
| | MIN | MAX | MIN | MAX | |
| A | 0.030 | 0.033 | 0.750 | 0.850 | |
| B | 0.008 | | 0.200 | | REF. |
| C | 0.000 | 0.002 | 0.000 | 0.050 | |
| D | 0.075 | 0.083 | 1.900 | 2.100 | |
| E | 0.075 | 0.083 | 1.900 | 2.100 | |
| F | 0.024 | 0.031 | 0.610 | 0.810 | |
| G | 0.028 | 0.036 | 0.710 | 0.910 | |
| H | 0.008 | 0.016 | 0.200 | 0.400 | |
| J | 0.010 | 0.014 | 0.250 | 0.350 | |
| K | 0.008 | 0.012 | 0.200 | 0.300 | |
| L | 0.026 | | 0.650 | | TYP. |

P-Channel MOSFET 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 | $R_{DS(on)}$ | $V_{GS}=-10V, I_D=-10A$ | | 30 | 40 | m Ω |
| | | $V_{GS}=-4.5V, I_D=-5A$ | | 45 | 60 | |
| Gate Resistance | R_g | f=1MHz, Open drain | | 17 | | Ω |
| Diode Characteristics | | | | | | |
| Continuous Body Diode Current | I_S | | | | -10 | A |
| Diode Forward Voltage | V_{SD} | $V_{GS}=0V, I_S=-10A$ | | | -1.2 | V |
| Reverse Recovery Time | t_{rr} | $I_S=-5A, dI_F/dt=100A/\mu s$ | | 32 | | ns |
| Reverse Recovery Charge | Q_{rr} | | | 12 | | nC |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=15V, V_{GS}=0V, f=1MHz$ | | 490 | | pF |
| Output Capacitance | C_{oss} | | | 75 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 60 | | |
| Total Gate Charge | Q_g | $V_{DS}=-15V, V_{GS}=-10V, I_D=-5A$ | | 9 | | nC |
| Gate-Source Charge | Q_{gs} | | | 1.5 | | |
| Gate-Drain Charge | Q_{gd} | | | 2.3 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{GS}=-15V, V_{DD}=-15V, R_G=2.5\Omega, I_D=-5A$ | | 9 | | ns |
| Turn-On Rise Time | t_r | | | 3 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 29 | | |
| Turn-Off Fall Time | t_f | | | 15 | | |

Curve Characteristics

Fig.1 - Typical Output Characteristics

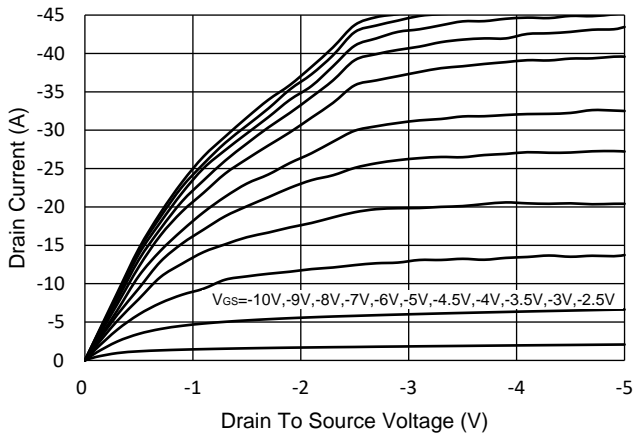


Fig.2 - Transfer Characteristics

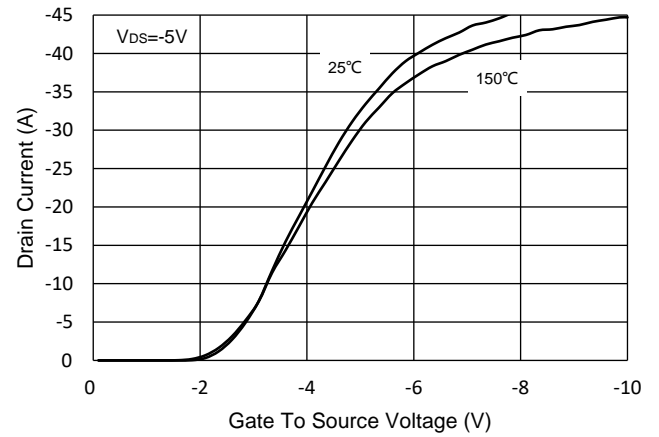


Fig.3 - $R_{DS(ON)}$ - V_{GS}

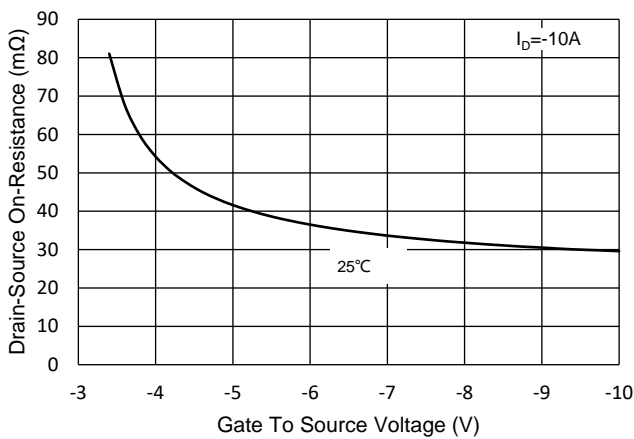


Fig.4 - $R_{DS(ON)}$ - I_D

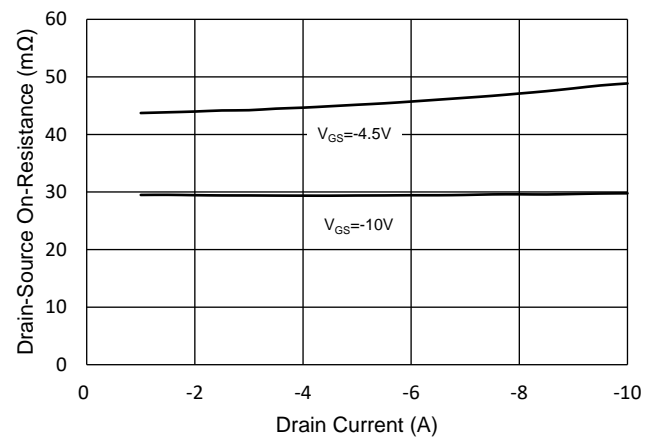


Fig.5 - Capacitance Characteristics

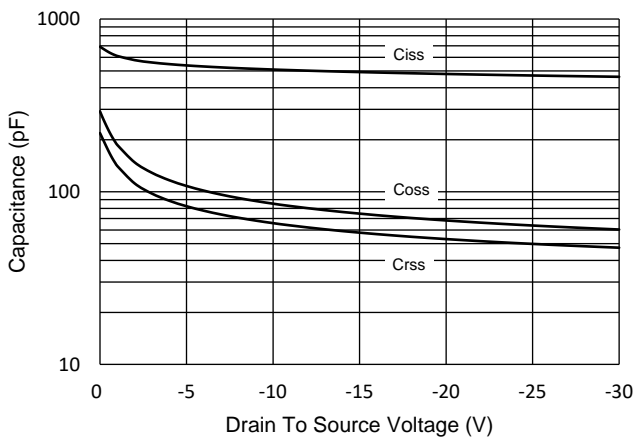
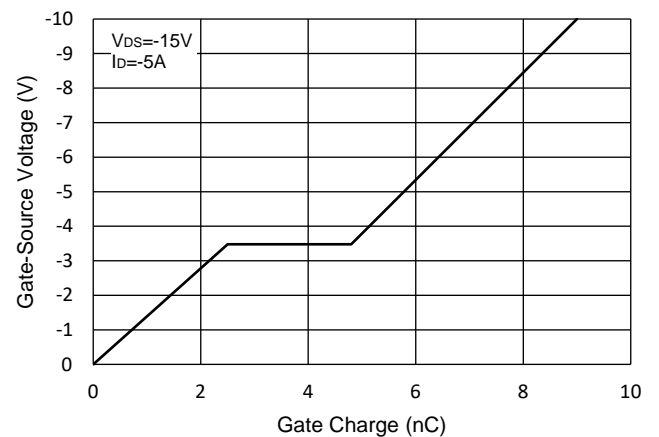


Fig.6 - Gate Charge



Curve Characteristics

Fig.7 - Normalized Threshold Voltage

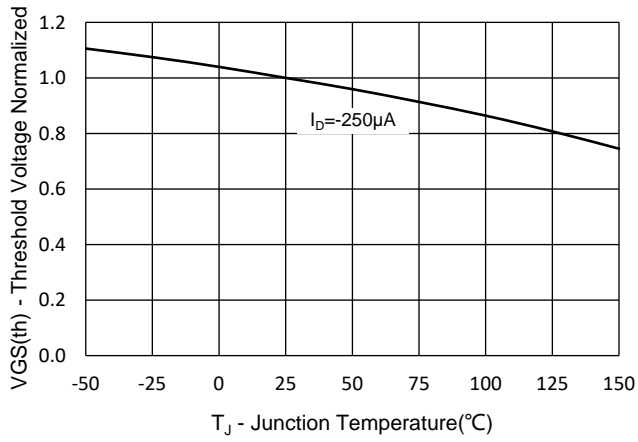


Fig.8 - Normalized On Resistance Characteristics

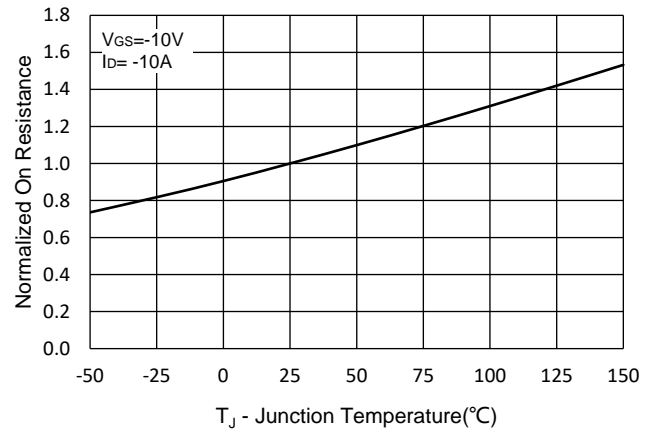


Fig.9 - I_S - V_{SD}

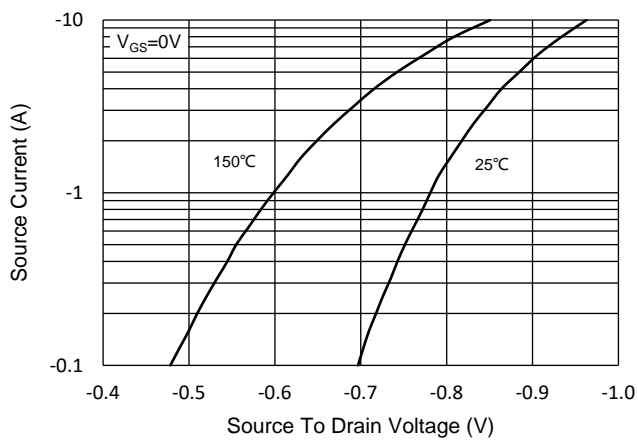


Fig.10 - Drain Current

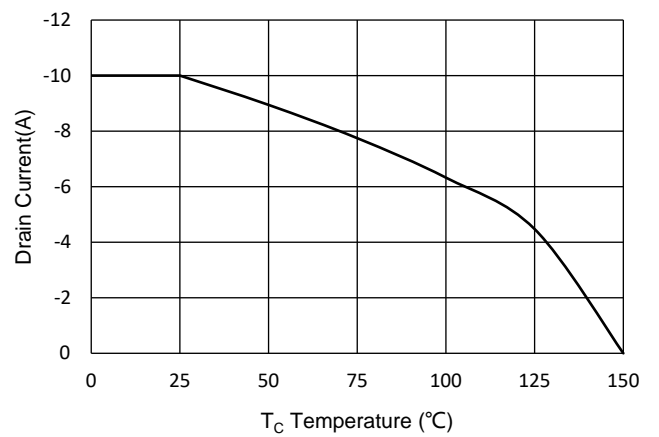
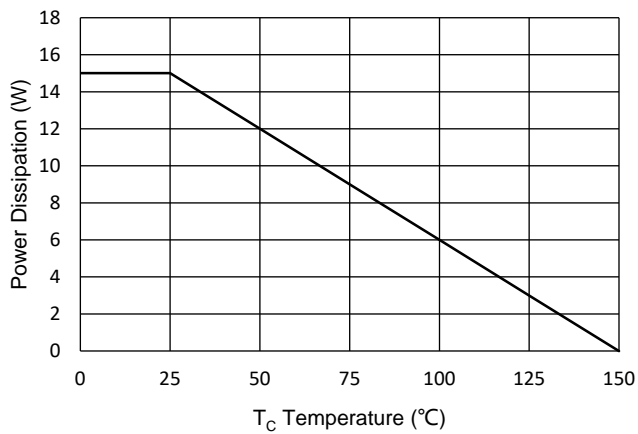


Fig.11 - PD Dissipation



Curve Characteristics

Fig.12 - Safe Operation Area

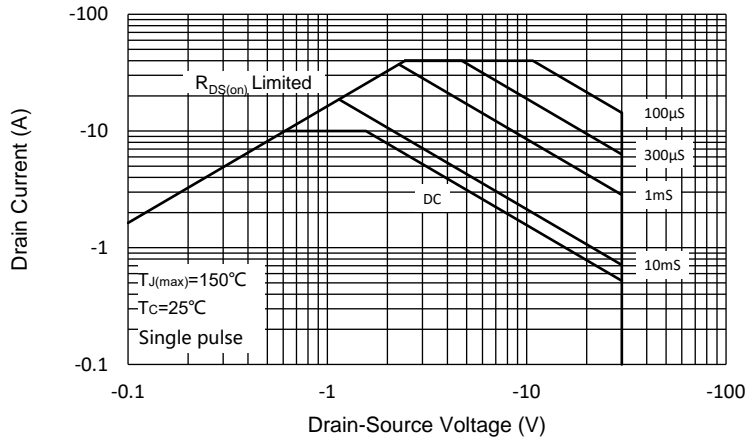
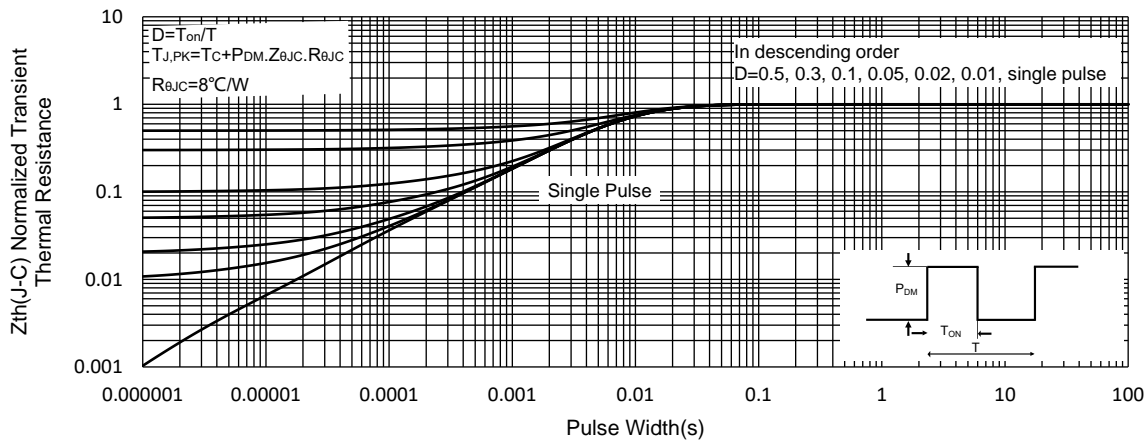


Fig.13 - Normalized Transient Thermal Impedance



Ordering Information

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

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