

Features

- AEC-Q101 Qualified
- Split Gate Trench MOSFET Technology
- Excellent Stability And Uniformity
- Moisture Sensitivity Level 1
- 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

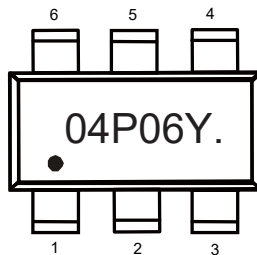
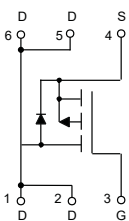
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 75°C/W Junction to Ambient^(Note2)

| Parameter | Symbol | Rating | Unit |
|--|----------|-------------------------|------|
| Drain-Source Voltage | V_{DS} | -60 | V |
| Gate-Source Voltage | V_{GS} | ±20 | V |
| Continuous Drain Current | I_D | $T_A=25^\circ\text{C}$ | -3.5 |
| | | $T_A=100^\circ\text{C}$ | -2.2 |
| Pulsed Drain Current ^(Note3) | I_{DM} | -14 | A |
| Total Power Dissipation ^(Note4) | P_D | 1.7 | W |

Note:

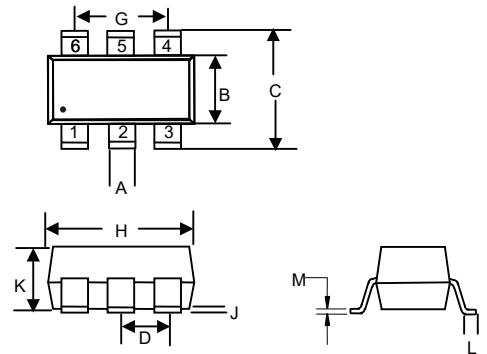
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The Value of $R_{\theta JA}$ is Measured with the Device Mounted on 1in2 FR-4 Board with 1oz. Copper, in a Still Air Environment with $T_A=25^\circ\text{C}$.
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



P-Channel MOSFET

SOT23-6L



| DIM | DIMENSIONS | | | | NOTE |
|-----|------------|-------|------|------|------|
| | INCHES | | MM | | |
| | MIN | MAX | MIN | MAX | |
| A | 0.012 | 0.020 | 0.30 | 0.50 | |
| B | 0.051 | 0.070 | 1.30 | 1.80 | |
| C | 0.087 | 0.126 | 2.20 | 3.20 | |
| D | 0.037 | | 0.95 | | TYP. |
| G | 0.074 | | 1.90 | | TYP. |
| H | 0.106 | 0.122 | 2.70 | 3.10 | |
| J | 0.002 | 0.006 | 0.05 | 0.15 | |
| K | 0.030 | 0.051 | 0.75 | 1.30 | |
| L | 0.012 | 0.024 | 0.30 | 0.60 | |
| M | 0.003 | 0.008 | 0.08 | 0.22 | |

Electrical Characteristics @ 25°C (Unless Otherwise Specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---------------------------------|---------------|---|------|------|-----------|------------|
| Static Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=-250\mu A$ | -60 | | | V |
| Gate-Source Leakage Current | I_{GSS} | $V_{DS}=0V, V_{GS}=\pm 20V$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=-60V, V_{GS}=0V$ | | | -1 | μA |
| Gate-Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=-250\mu A$ | -1.0 | -1.6 | -2.5 | V |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=-10V, I_D=-4A$ | | 65 | 85 | m Ω |
| | | $V_{GS}=-4.5V, I_D=-2A$ | | 80 | 120 | |
| Gate Resistance | R_g | f=1 MHz, Open drain | | 3 | | Ω |
| Diode Characteristics | | | | | | |
| Continuous Body Diode Current | I_S | | | | -3.5 | A |
| Diode Forward Voltage | V_{SD} | $V_{GS}=0V, I_S=-1A$ | | | -1.2 | V |
| Reverse Recovery Time | t_{rr} | $I_F=-4A, di_F/dt=100A/\mu s$ | | 20 | | ns |
| Reverse Recovery Charge | Q_{rr} | | | 15 | | nC |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=-25V, V_{GS}=0V, f=1MHz$ | | 491 | | pF |
| Output Capacitance | C_{oss} | | | 93 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 7 | | |
| Total Gate Charge | Q_g | $V_{DD}=-30V, V_{GS}=-4.5V, I_D=-3.1A$ | | 4.27 | | nC |
| Gate-Source Charge | Q_{gs} | | | 2.39 | | |
| Gate-Drain Charge | Q_{gd} | | | 1.1 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}=-30V, V_{GS}=-4.5V, I_D=-2.4A, R_G=1\Omega$ | | 11 | | ns |
| Turn-On Rise Time | t_r | | | 33.8 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 12.4 | | |
| Turn-Off Fall Time | t_f | | | 23.2 | | |

Curve Characteristics

Fig. 1 - Typical Output Characteristics

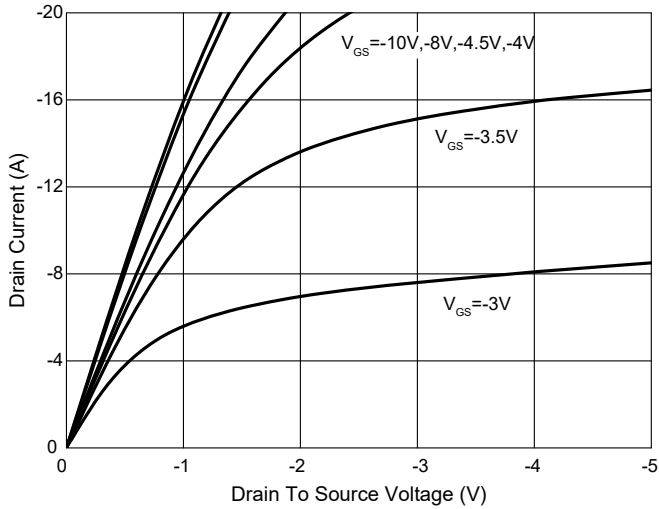


Fig. 2 - Transfer Characteristics

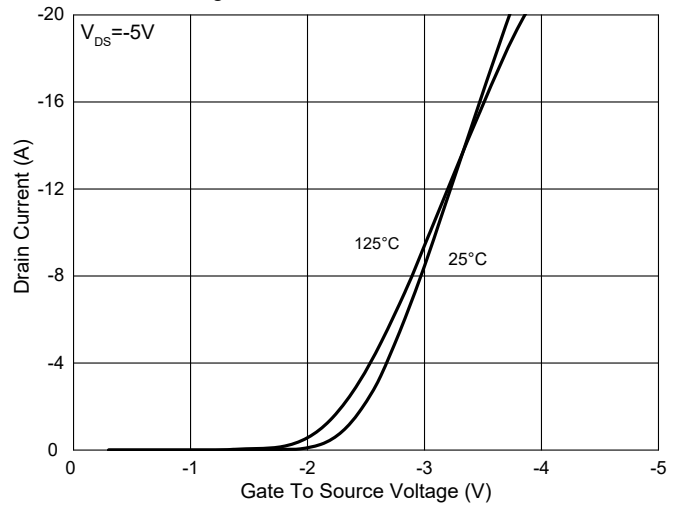


Fig. 3 - $R_{DS(ON)} - V_{GS}$

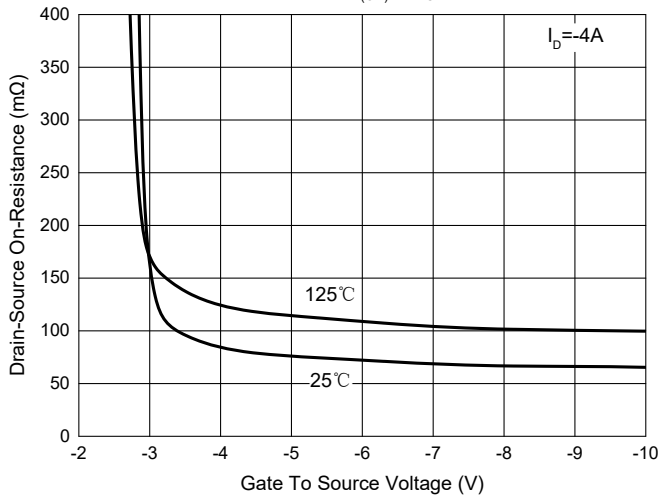


Fig. 4 - $R_{DS(ON)} - I_D$

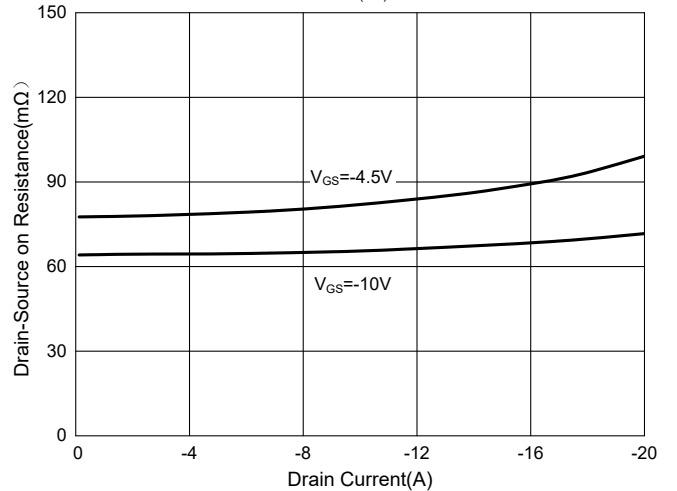


Fig. 5 - Capacitance Characteristics

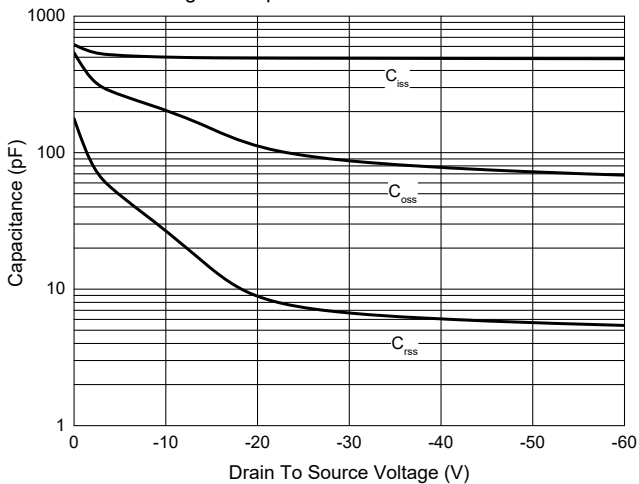
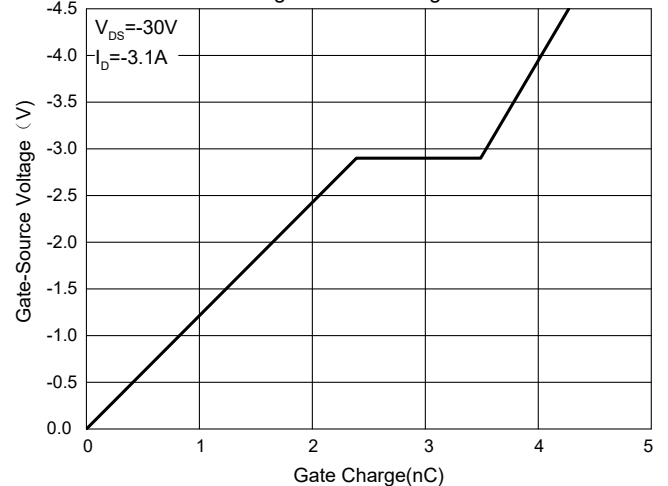


Fig. 6 - Gate Charge



Curve Characteristics

Fig. 7 - Normalized Threshold Voltage

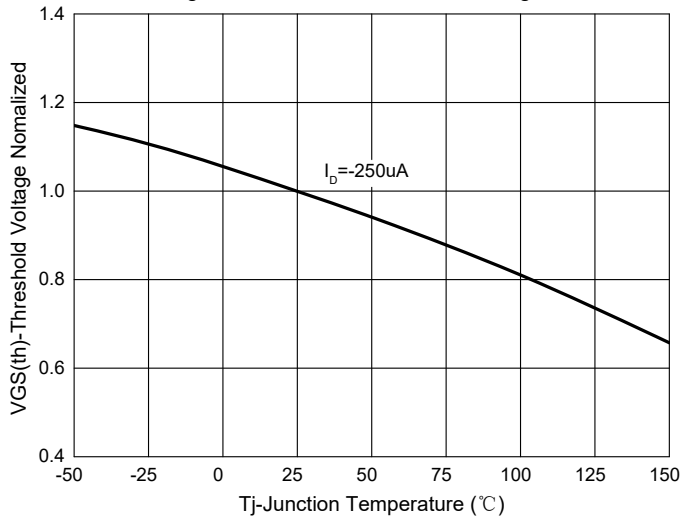


Fig.8-Normalized On Resistance Characteristics

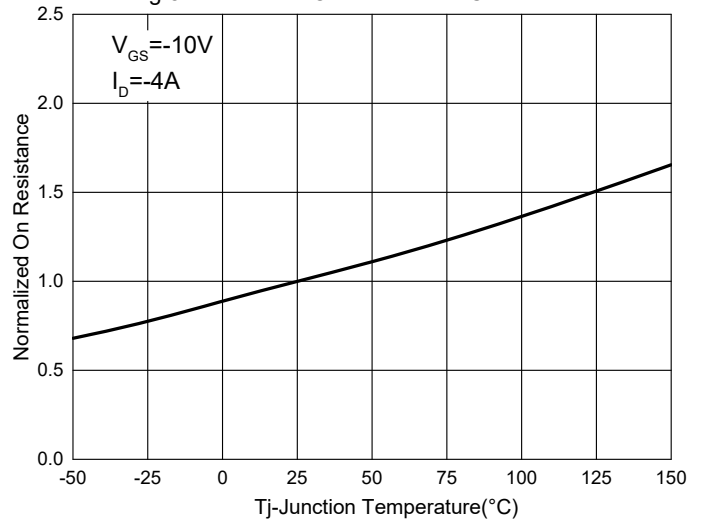


Fig.9 - $I_s - V_{SD}$

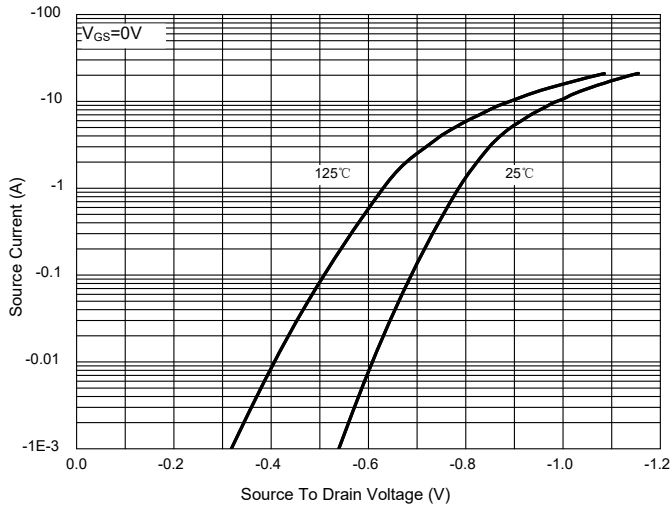


Fig. 10 - Drain Current

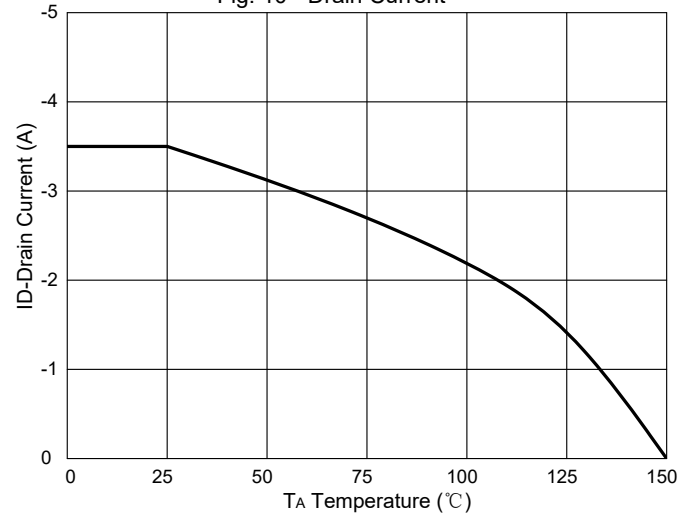
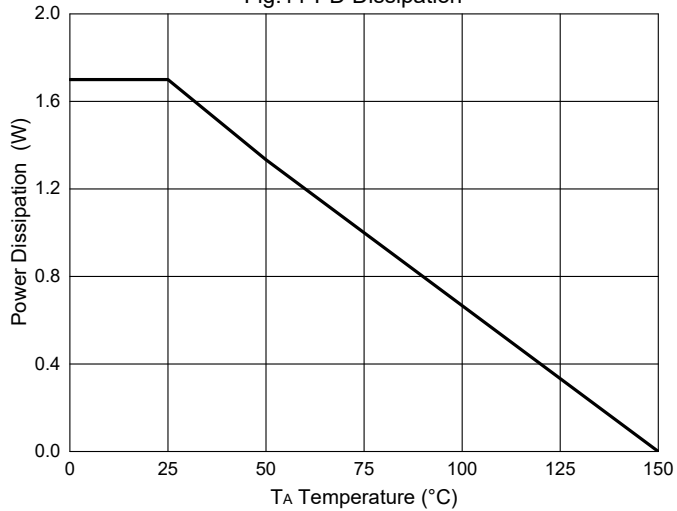


Fig.11-PD Dissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

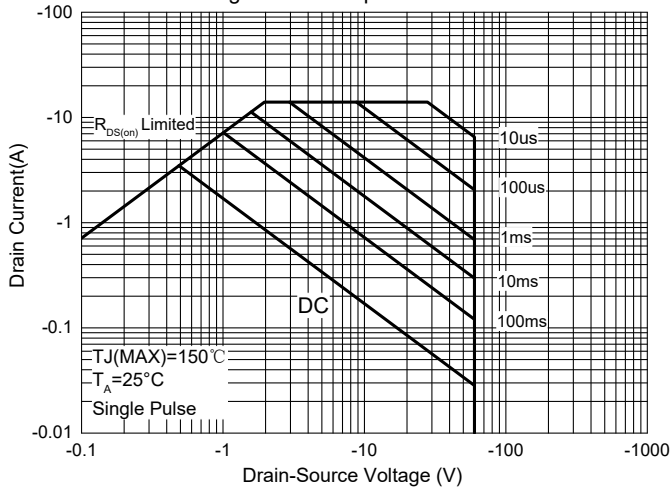
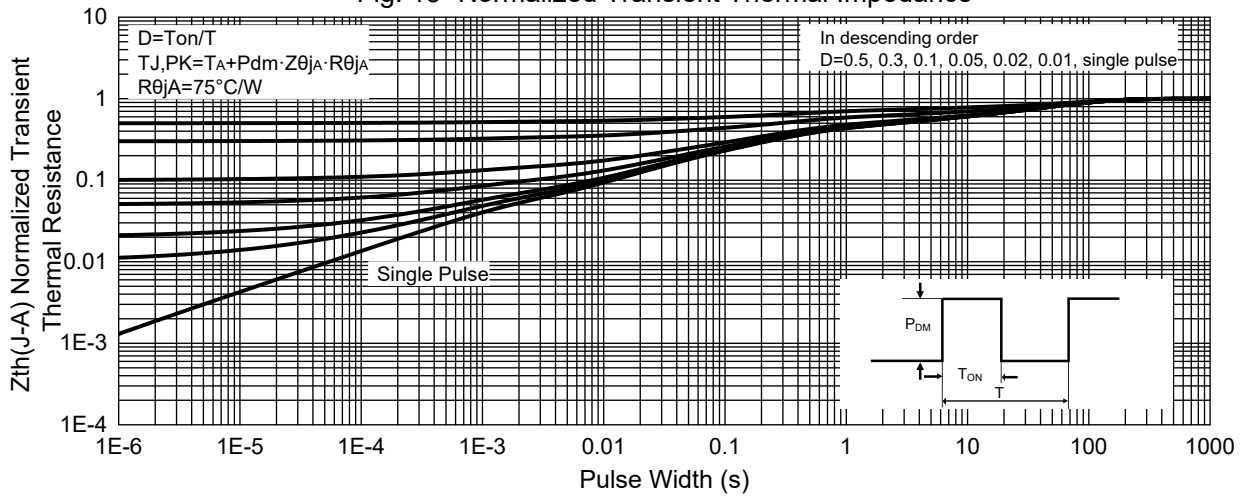


Fig. 13 - Normalized Transient Thermal Impedance



Ordering Information

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

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