



**THE DATASHEET OF
SI3407-TP**



Features

- Epoxy Meets UL 94 V-0 Flammability Rating
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device (Note 1)
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

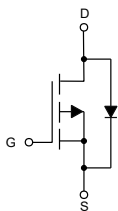
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 96°C/W Junction to Ambient (Note 2)

| Parameter | Symbol | Rating | Unit |
|----------------------------------|----------|-------------------------|------|
| Drain-Source Voltage | V_{DS} | -30 | V |
| Gate-Source Voltage | V_{GS} | ±20 | V |
| Continuous Drain Current | I_D | $T_A=25^\circ\text{C}$ | -4.1 |
| | | $T_A=100^\circ\text{C}$ | -2.6 |
| Pulsed Drain Current (Note 3) | I_{DM} | 16.4 | A |
| Total Power Dissipation (Note 4) | P_D | 1.3 | W |

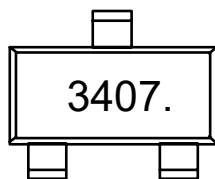
Note:

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

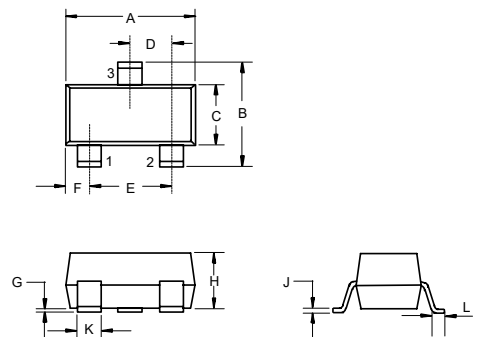


1. GATE
2. SOURCE
3. DRAIN



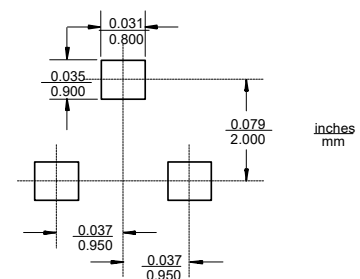
P-CHANNEL MOSFET

SOT-23



| DIM | DIMENSIONS | | | | NOTE |
|-----|------------|-------|------|------|------|
| | INCHES | | MM | | |
| | MIN | MAX | MIN | MAX | |
| A | 0.110 | 0.120 | 2.80 | 3.04 | |
| B | 0.083 | 0.104 | 2.10 | 2.64 | |
| C | 0.047 | 0.055 | 1.20 | 1.40 | |
| D | 0.034 | 0.041 | 0.85 | 1.05 | |
| E | 0.067 | 0.083 | 1.70 | 2.10 | |
| F | 0.018 | 0.024 | 0.45 | 0.60 | |
| G | 0.0004 | 0.006 | 0.01 | 0.15 | |
| H | 0.035 | 0.043 | 0.90 | 1.10 | |
| J | 0.003 | 0.007 | 0.08 | 0.18 | |
| K | 0.012 | 0.020 | 0.30 | 0.51 | |
| L | 0.007 | 0.020 | 0.20 | 0.50 | |

Suggested Solder Pad Layout



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} | $V_{DS}=-24V, V_{GS}=0V$ | | | -1 | μA |
| Gate-Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=-250\mu A$ | -1 | -1.4 | -3 | V |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=-10V, I_D=-4.1A$ | | 36 | 49 | m Ω |
| | | $V_{GS}=-4.5V, I_D=-3A$ | | 52 | 65 | |
| Forward tranconductance | g_{FS} | $V_{DS}=-5V, I_D=-4A$ | | 11 | | S |
| Gate Resistance | R_g | $V_{DS}=0V, V_{GS}=0V, f=1MHz$ | | 11 | | Ω |
| Diode Characteristics | | | | | | |
| Continuous Body Diode Current | I_S | $T_A=25^\circ C$ | | | -4.1 | A |
| Body Diode Voltage | V_{SD} | $I_S=-1A, V_{GS}=0V$ | | | -1.2 | V |
| Reverse Recovery Time | t_{rr} | $I_F=-2.2A, di/dt=100A/\mu s$ | | 12.4 | | ns |
| Reverse Recovery Charge | Q_{rr} | | | 3.8 | | nC |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=-15V, V_{GS}=0V, f=1MHz$ | | 600 | | pF |
| Output Capacitance | C_{oss} | | | 74 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 65 | | |
| Total Gate Charge | Q_g | $V_{GS}=-10V, V_{DS}=-15V, I_D=-4.1A$ | | 13 | | nC |
| Gate-Source Charge | Q_{gs} | | | 1.6 | | |
| Gate-Drain Charge | Q_{gd} | | | 2.3 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{GS}=-10V, V_{DS}=-15V, R_L=3.6\Omega, R_{GEN}=3\Omega$ | | 6.4 | | ns |
| Turn-On Rise Time | t_r | | | 3.9 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 22.9 | | |
| Turn-Off Fall Time | t_f | | | 9.5 | | |

Curve Characteristics

Fig.1 - Typical Output Characteristics

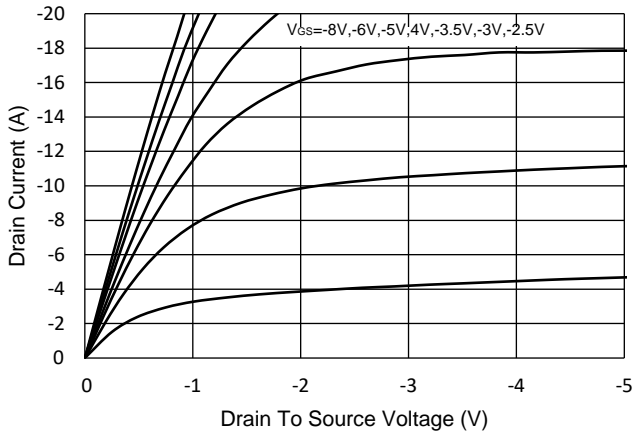


Fig.2 - Transfer Characteristic

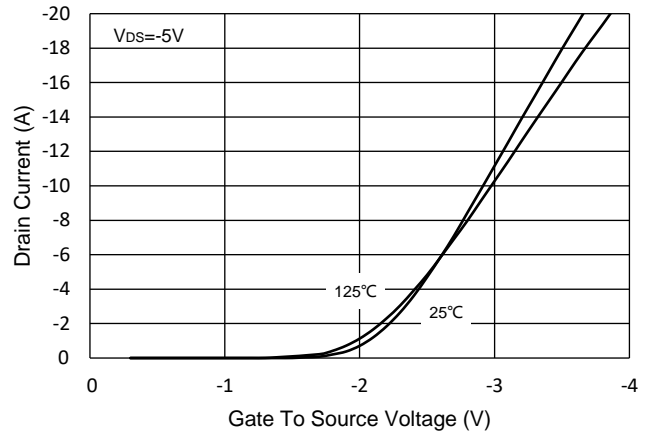


Fig.3 - $R_{DS(ON)}$ - V_{GS}

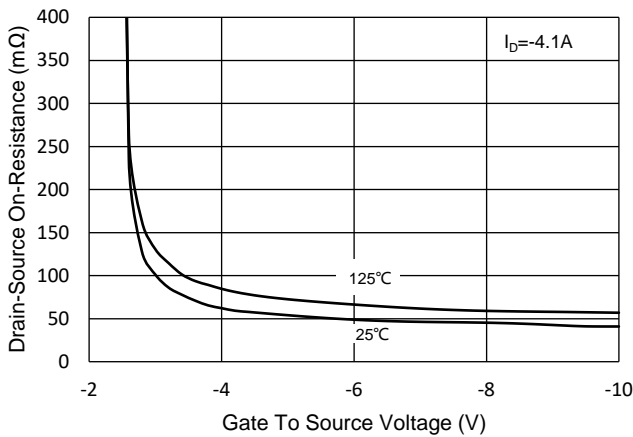


Fig.4 - $R_{DS(ON)}$ - I_D

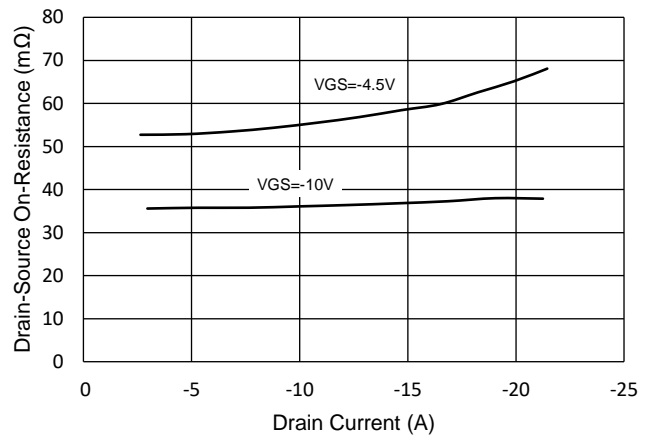


Fig.5 - Capacitance Characteristics

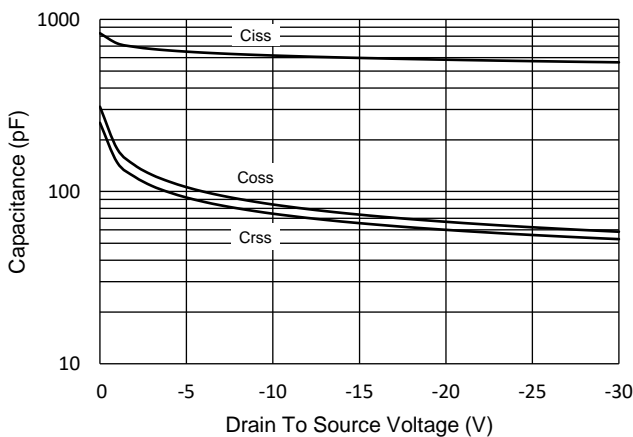
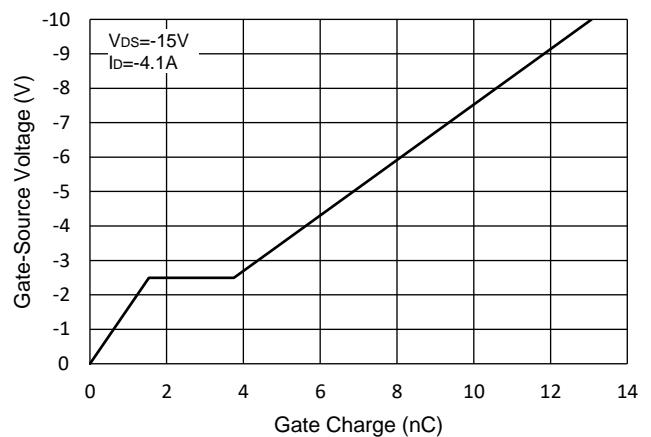


Fig.6 - Gate Charge



Curve Characteristics

Fig.7 - Normalized Threshold Voltage

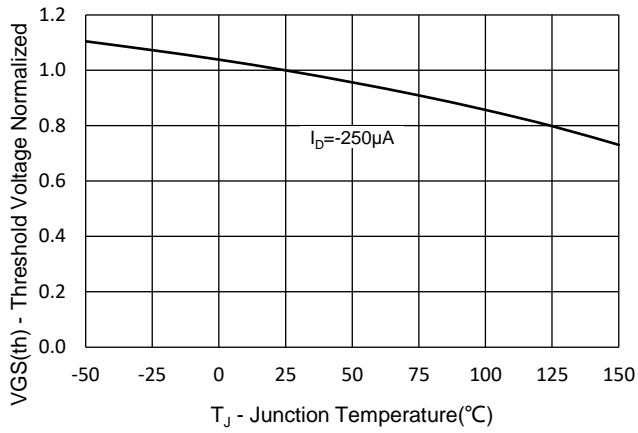


Fig.8 - Normalized On Resistance Characteristics

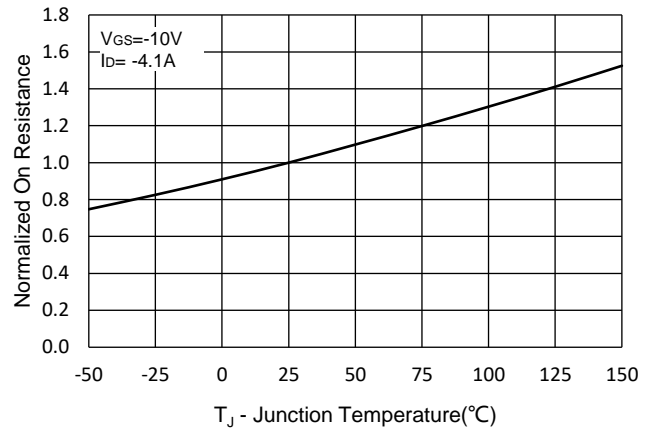


Fig.9 - I_S - V_{SD}

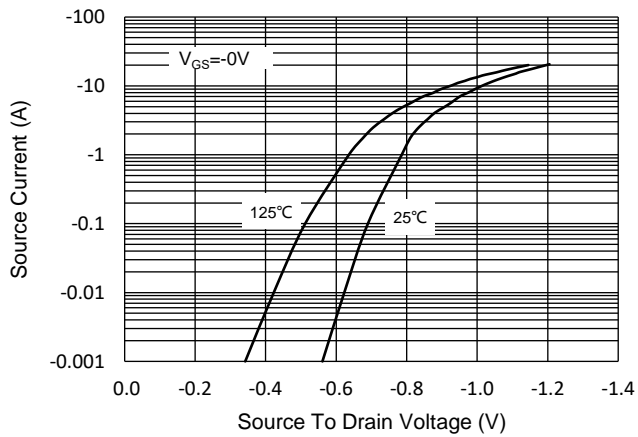


Fig.10 - Drain Current

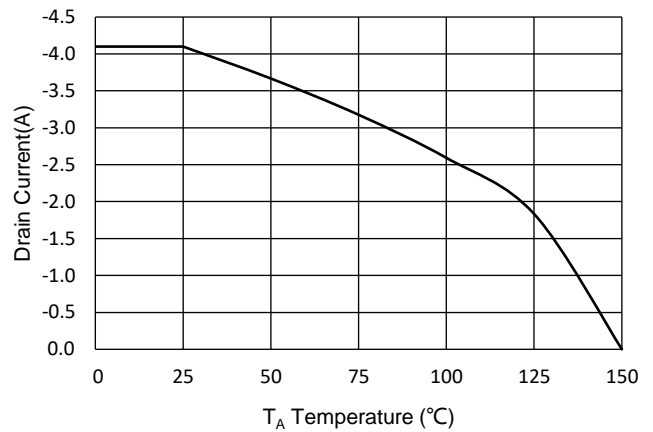
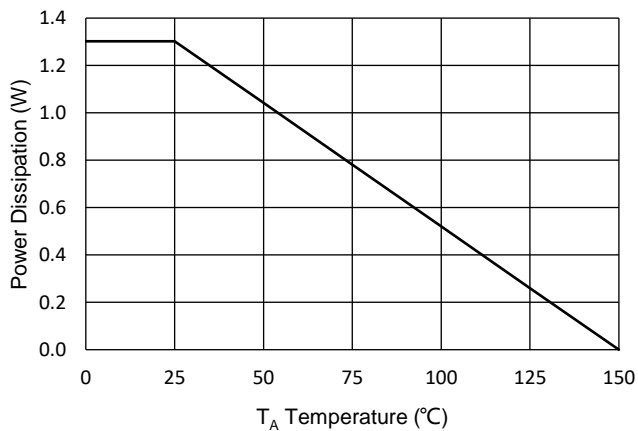


Fig.11 - PD Dissipation



Curve Characteristics

Fig.12 - Safe Operation Area

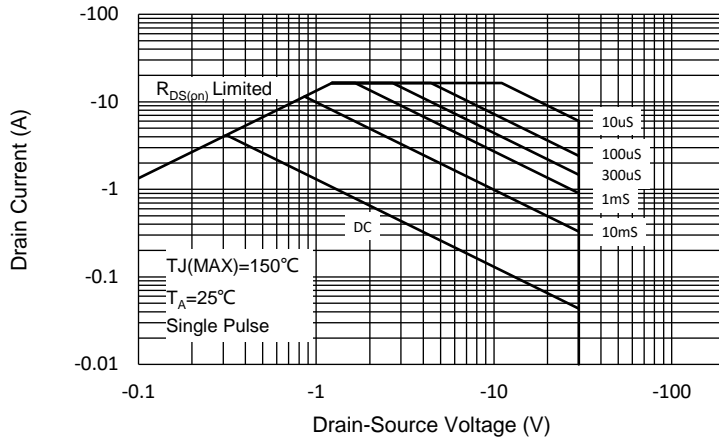
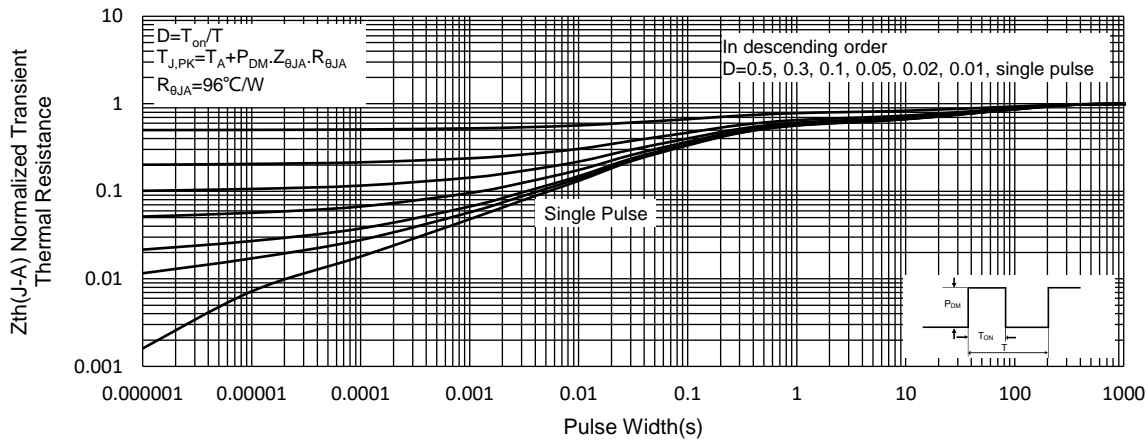


Fig.13 - Normalized Transient Thermal Impedance



Ordering Information

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

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