

### Features

- High Density Cell Design For Low  $R_{DS(ON)}$
- Exceptional On-Resistance and Maximum DC Current Capability
- 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)

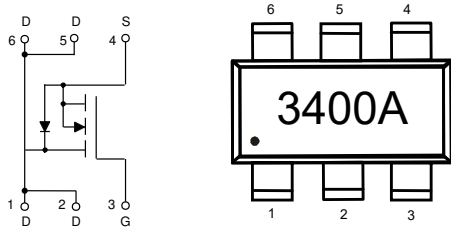
### Maximum Ratings

- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Maximum Thermal Resistance: 62.5°C/W Junction to Ambient<sup>(Note2)</sup>

| Parameter                               | Symbol   | Rating | Unit |
|---|----------|--------|------|
| Drain-Source Voltage                    | $V_{DS}$ | 30     | V    |
| Gate-Source Voltage                     | $V_{GS}$ | ±12    | V    |
| Continuous Drain Current                | $I_D$    | 5.8    | A    |
| Pulsed Drain Current <sup>(Note3)</sup> | $I_{DM}$ | 30     | A    |
| Total Power Dissipation                 | $P_D$    | 2      | W    |

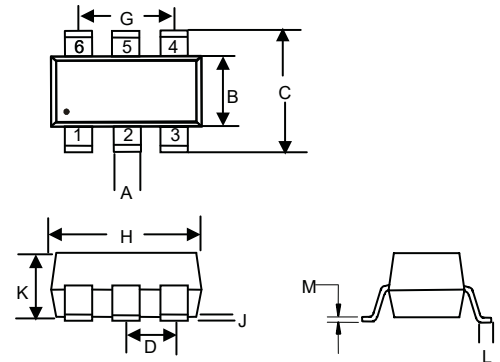
- Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.  
 2. Surface Mounted on FR4 Board,  $t < 5\text{sec}$ .  
 3. Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature.

### Internal Structure and Marking Code



## N-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       |
|---|---------------|--|-----|-----|-----------|------------|
| <b>Static Characteristics</b>                       |               |  |     |     |           |            |
| Drain-Source Breakdown Voltage                      | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$                                | 30  |     |           | V          |
| Gate-Source Leakage Current                         | $I_{GSS}$     | $V_{DS}=0V, V_{GS}=\pm 12V$                              |     |     | $\pm 100$ | nA         |
| Zero Gate Voltage Drain Current                     | $I_{DSS}$     | $V_{DS}=24V, V_{GS}=0V$                                  |     |     | 1         | $\mu A$    |
| Gate-Threshold Voltage <sup>(Note 4)</sup>          | $V_{GS(th)}$  | $V_{DS}=V_{GS}, I_D=250\mu A$                            | 0.7 |     | 1.4       | V          |
| Drain-Source On-Resistance <sup>(Note 4)</sup>      | $R_{DS(on)}$  | $V_{GS}=10V, I_D=5.8A$                                   |     | 29  | 32        | m $\Omega$ |
|   |               | $V_{GS}=4.5V, I_D=5A$                                    |     | 32  | 38        |            |
|   |               | $V_{GS}=2.5V, I_D=4A$                                    |     | 40  | 45        |            |
| Forward Transconductance <sup>(Note 4)</sup>        | $g_{FS}$      | $V_{DS}=5V, I_D=5A$                                      | 8   |     |           | S          |
| <b>Dynamic Characteristics<sup>(Note 5)</sup></b>   |               |  |     |     |           |            |
| Input Capacitance                                   | $C_{iss}$     | $V_{DS}=15V, V_{GS}=0V, f=1MHz$                          |     |     | 1155      | pF         |
| Output Capacitance                                  | $C_{oss}$     |  |     | 108 |           |            |
| Reverse Transfer Capacitance                        | $C_{rss}$     |  |     | 84  |           |            |
| Gate Resistance                                     | $R_g$         | $V_{DS}=0V, V_{GS}=0V, f=1MHz$                           |     |     | 3.6       | $\Omega$   |
| <b>Switching Characteristics<sup>(Note 5)</sup></b> |               |  |     |     |           |            |
| Total Gate Charge                                   | $Q_g$         | $V_{DS}=15V, V_{GS}=4.5V, I_D=5.6A$                      |     | 4.8 |           | nC         |
| Gate-Source Charge                                  | $Q_{gs}$      |  |     | 1.2 |           |            |
| Gate-Drain Charge                                   | $Q_{gd}$      |  |     | 1.7 |           |            |
| Turn-On Delay Time                                  | $t_{d(on)}$   | $V_{GS}=10V, V_{DS}=15V, R_L=2.7\Omega, R_{GEN}=3\Omega$ |     |     | 5         | ns         |
| Turn-On Rise Time                                   | $t_r$         |  |     |     | 7         |            |
| Turn-Off Delay Time                                 | $t_{d(off)}$  |  |     |     | 40        |            |
| Turn-Off Fall Time                                  | $t_f$         |  |     |     | 6         |            |
| <b>Drain-Source Body Diode Characteristics</b>      |               |  |     |     |           |            |
| Body Diode Voltage <sup>(Note 4)</sup>              | $V_{SD}$      | $I_S=1A, V_{GS}=0V$                                      |     |     | 1         | V          |

Note 4. Pulse Test : Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .

5. Guaranteed by Design, Not Subject to Production Testing.

**Curve Characteristics**

Fig. 1 - Output Characteristics

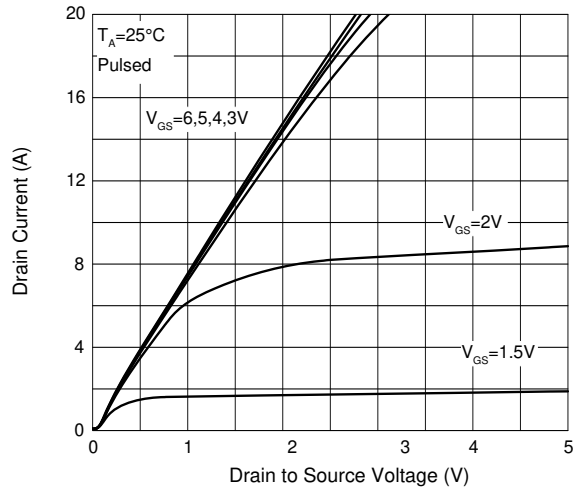


Fig. 2 - Transfer Characteristics

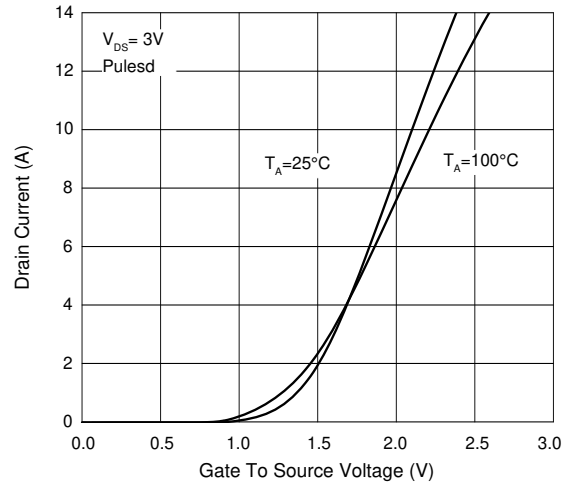


Fig. 3 -  $R_{DS(ON)} - I_D$

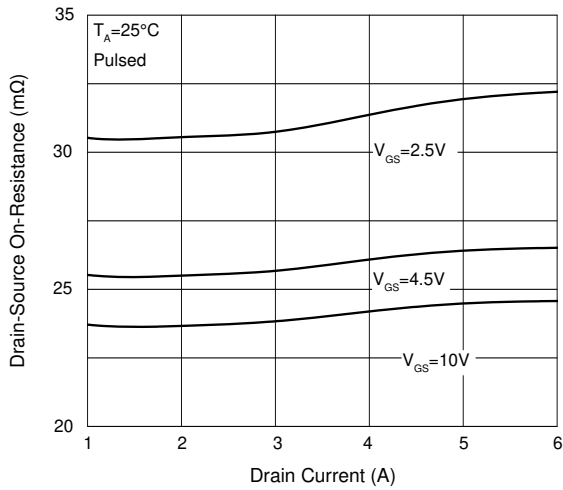


Fig. 4 -  $R_{DS(ON)} - V_{GS}$

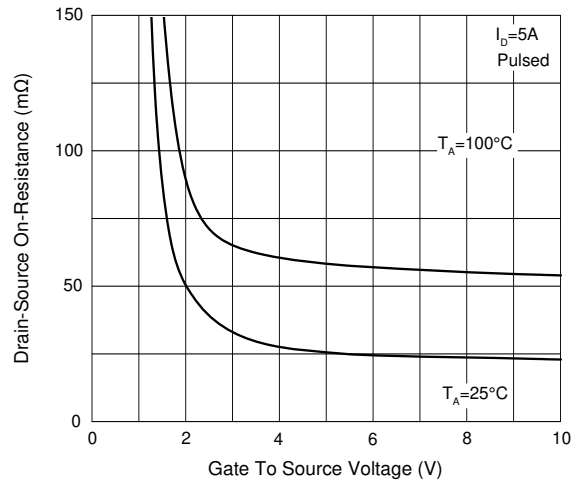


Fig. 5 -  $I_S - V_{SD}$

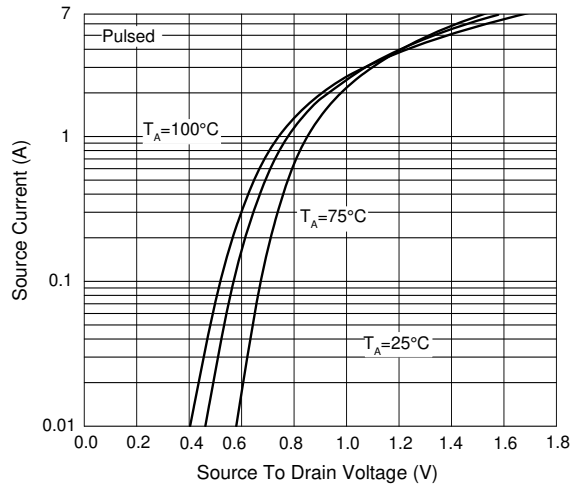
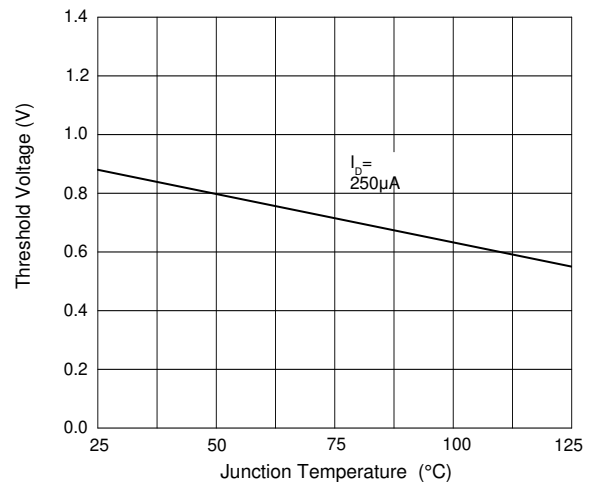


Fig. 6 - Threshold Voltage



## Ordering Information

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

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