



#### Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$    | $I_D$ |
|---------------|--------------------|-------|
| 20V           | 30m $\Omega$ @4.5V | 4A    |
|               | 40m $\Omega$ @2.5V |       |

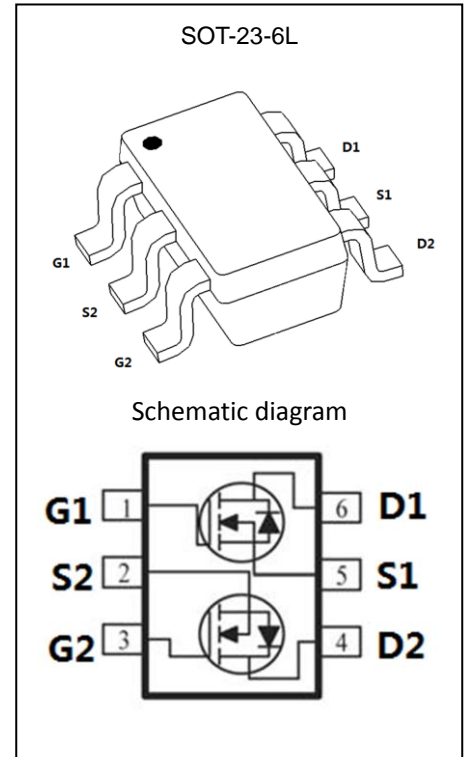
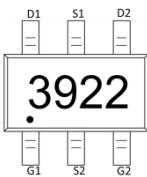
#### Feature

- Low on-resistance
- Low drive current
- Low  $R_{DS(on)}$  Provides Higher Efficiency and Extends Battery Life
- Fast switching speed
- High performance trench technology

#### Application

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch

#### MARKING:



#### ABSOLUTE MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$ unless otherwise noted)

| Parameter   | Symbol          | Value     | Unit                      |
|---|-----------------|-----------|---------------------------|
| Drain-Source Voltage  | $V_{DS}$        | 20        | V                         |
| Gate-Source Voltage   | $V_{GS}$        | $\pm 8$   | V                         |
| Continuous Drain Current <sup>(1)</sup>                     | $I_D$           | 4         | A                         |
| Continuous Source Current (Diode Conduction) <sup>(1)</sup> | $I_S$           | 1.8       | A                         |
| Pulsed Drain Current <sup>(2)</sup>                         | $I_{DM}$        | 15        | A                         |
| Power Dissipation <sup>(1)</sup>                            | $P_D$           | 0.45      | W                         |
| Thermal Resistance from Junction to Ambient                 | $R_{\theta JA}$ | 277       | $^\circ\text{C}/\text{W}$ |
| Junction Temperature  | $T_J$           | 150       | $^\circ\text{C}$          |
| Storage Temperature   | $T_{STG}$       | -55~ +150 | $^\circ\text{C}$          |

**MOSFET ELECTRICAL CHARACTERISTICS( $T_a=25^{\circ}\text{C}$  unless otherwise noted)**

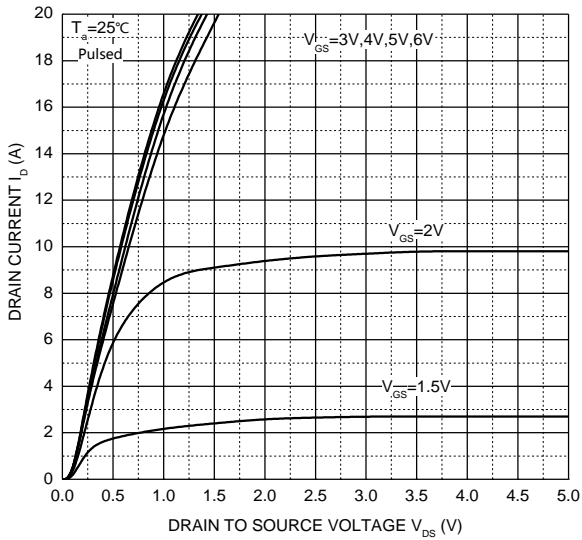
| Parameter                                 | Symbol        | Test Condition  | Min | Type | Max       | Unit       |
|---|---------------|---|-----|------|-----------|------------|
| <b>Static Characteristics</b>             |               |   |     |      |           |            |
| Drain-source breakdown voltage            | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$   | 20  | 22   |           | V          |
| Zero gate voltage drain current           | $I_{DSS}$     | $V_{DS} = 16V, V_{GS} = 0V$   |     |      | 1         | $\mu A$    |
| Gate-body leakage current                 | $I_{GSS}$     | $V_{GS} = \pm 8V, V_{DS} = 0V$  |     |      | $\pm 0.1$ | $\mu A$    |
| Gate threshold voltage                    | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = 250\mu A$   | 0.4 | 0.8  | 1.2       | V          |
| On-State Drain Current <sup>(1)</sup>     | $I_{D(on)}$   | $V_{DS} = 5V, V_{GS} = 4.5V$  | 6   |      |           | A          |
| Drain-source on-resistance <sup>(1)</sup> | $R_{DS(on)}$  | $V_{GS} = 4.5V, I_D = 3.6A$   |     | 30   | 39        | m $\Omega$ |
|   |               | $V_{GS} = 2.5V, I_D = 3.1A$   |     | 40   | 55        |            |
| Forward tranconductance <sup>(1)</sup>    | $g_{FS}$      | $V_{DS} = 15V, I_D = 2A$  | 8   |      |           | S          |
| <b>Dynamic characteristics</b>            |               |   |     |      |           |            |
| Input Capacitance                         | $C_{iss}$     | $V_{DS} = 15V, V_{GS} = 0V, f = 1MHz$   |     | 241  |           | pF         |
| Output Capacitance                        | $C_{oss}$     |   |     | 39   |           |            |
| Reverse Transfer Capacitance              | $C_{rss}$     |   |     | 36   |           |            |
| Total gate charge                         | $Q_g$         | $V_{DS} = 10V, V_{GS} = 4.5V, I_D = 2.0A$                                       |     | 13   |           | nC         |
| Gate-source charge                        | $Q_{gs}$      |   |     | 3.1  |           |            |
| Gate-drain charge                         | $Q_{gd}$      |   |     | 3.7  |           |            |
| <b>Switching Characteristics</b>          |               |   |     |      |           |            |
| Turn-on delay time                        | $t_{d(on)}$   | $V_{DS} = 10V, R_L = 5\Omega, I_D = 2A,$<br>$V_{GNE} = 4.5V, R_{GNE} = 6\Omega$ |     | 9    |           | ns         |
| Turn-on rise time                         | $t_r$         |   |     | 20   |           |            |
| Turn-off delay time                       | $t_{d(off)}$  |   |     | 58   |           |            |
| Turn-off fall time                        | $t_f$         |   |     | 16   |           |            |
| <b>Source-Drain Diode characteristics</b> |               |   |     |      |           |            |
| Diode Forward voltage                     | $V_{DS}$      | $V_{GS} = 0V, I_S = 0.9A$   |     |      | 1.2       | V          |

Notes:

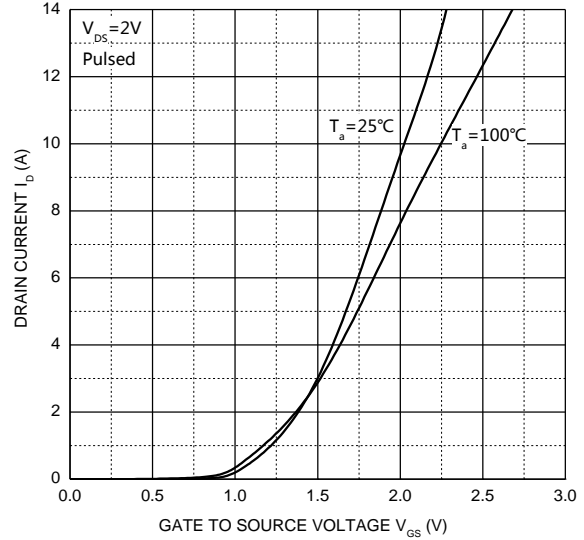
1. Pulse test:  $PW \leq 300\mu s$  duty cycle  $\leq 2\%$ .
2. Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal Characteristics

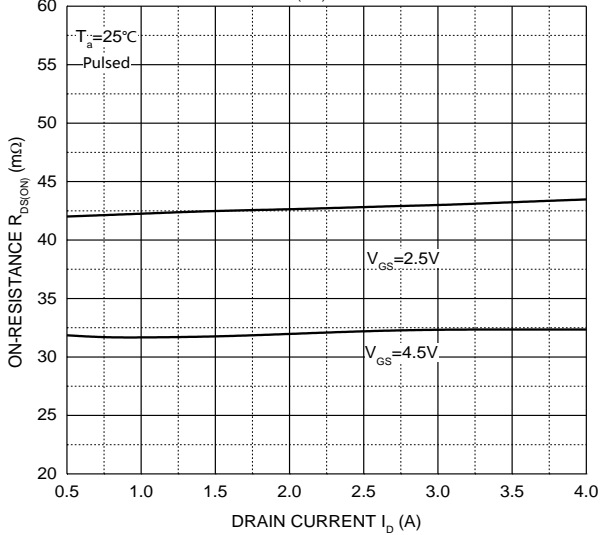
Output Characteristics



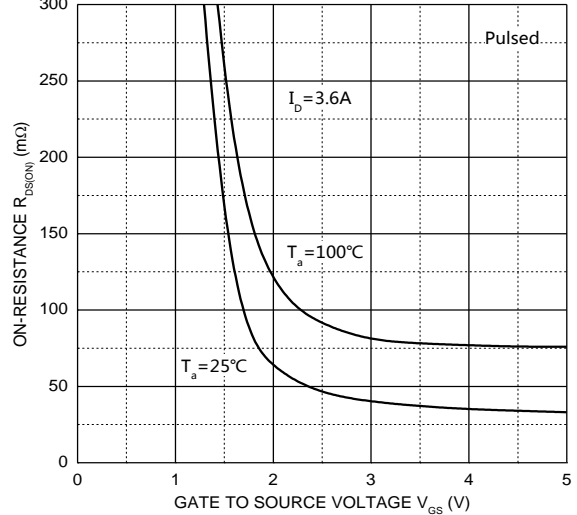
Transfer Characteristics



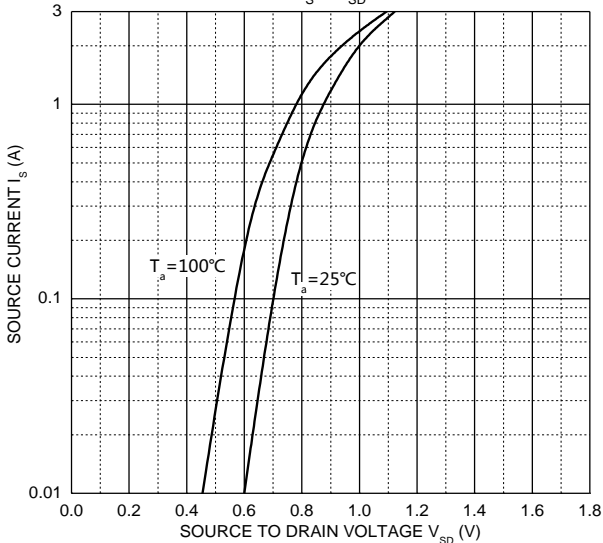
$R_{DS(ON)} - I_D$



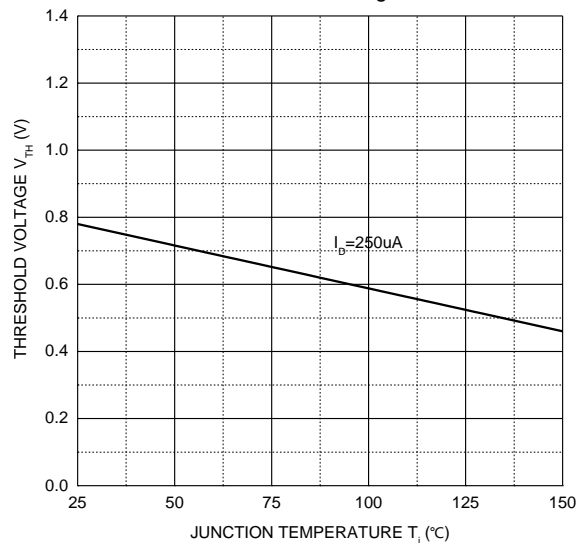
$R_{DS(ON)} - V_{GS}$



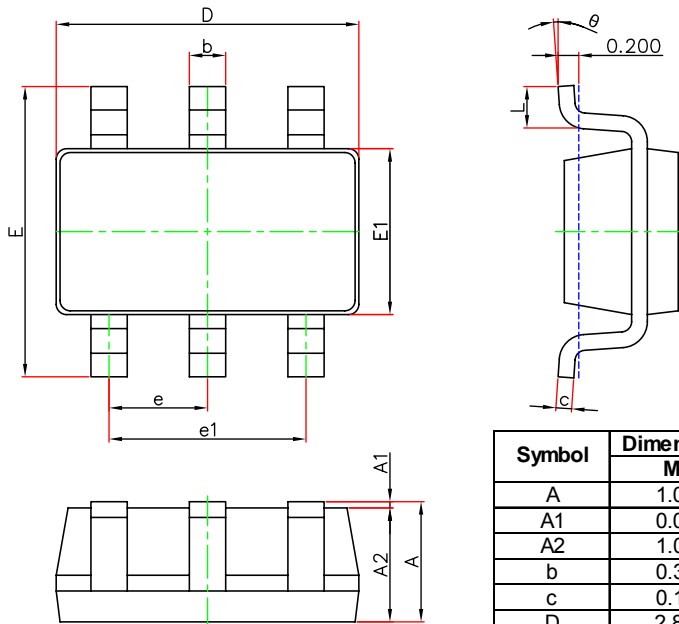
$I_S - V_{SD}$



Threshold Voltage



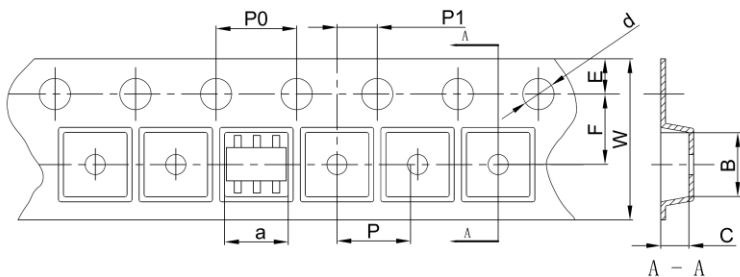
## SOT-23-6L Package Information



| Symbol   | Dimensions In Millimeters |       | Dimensions In Inches |       |
|----------|---------------------------|-------|----------------------|-------|
|          | Min.                      | Max.  | Min.                 | Max.  |
| A        | 1.050                     | 1.250 | 0.041                | 0.049 |
| A1       | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2       | 1.050                     | 1.150 | 0.041                | 0.045 |
| b        | 0.300                     | 0.500 | 0.012                | 0.020 |
| c        | 0.100                     | 0.200 | 0.004                | 0.008 |
| D        | 2.820                     | 3.020 | 0.111                | 0.119 |
| E1       | 1.500                     | 1.700 | 0.059                | 0.067 |
| E        | 2.650                     | 2.950 | 0.104                | 0.116 |
| e        | 0.950(BSC)                |       | 0.037(BSC)           |       |
| e1       | 1.800                     | 2.000 | 0.071                | 0.079 |
| L        | 0.300                     | 0.600 | 0.012                | 0.024 |
| $\theta$ | 0°                        | 8°    | 0°                   | 8°    |

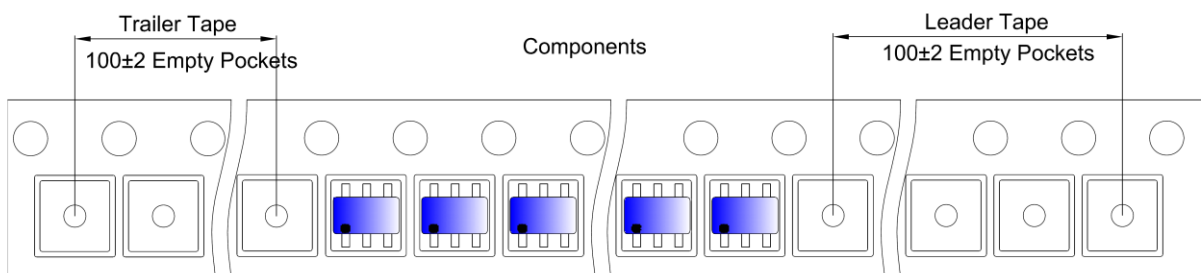
## SOT-23-6L Tape and Reel

### SOT-23-6L Embossed Carrier Tape

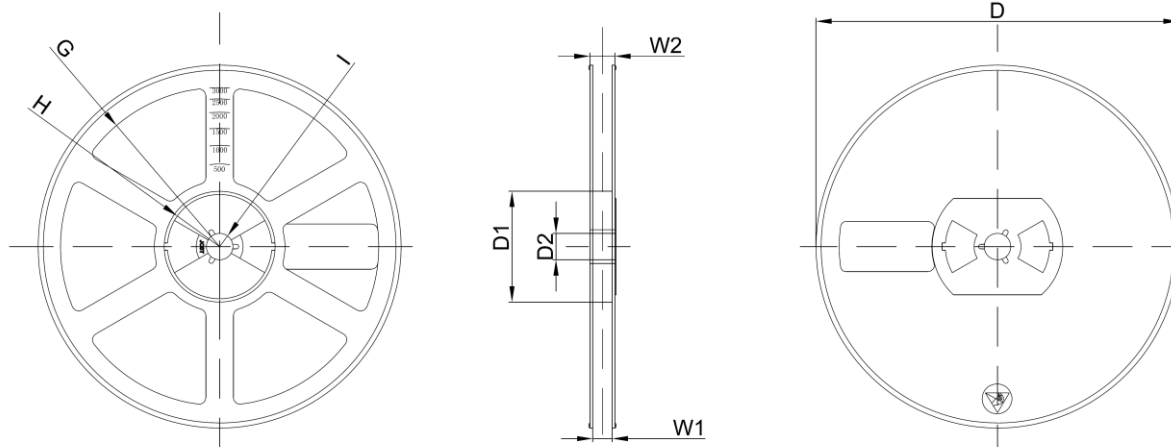


| Dimensions are in millimeter |      |      |      |       |      |      |      |      |      |      |
|------------------------------|------|------|------|-------|------|------|------|------|------|------|
| Pkg type                     | a    | B    | C    | d     | E    | F    | P0   | P    | P1   | W    |
| SOT-23-6L                    | 3.17 | 3.23 | 1.37 | Ø1.55 | 1.75 | 3.50 | 4.00 | 4.00 | 2.00 | 8.00 |

### SOT-23-6L Tape Leader and Trailer



### SOT-23-6L Reel



| Dimensions are in millimeter |         |       |       |        |        |       |      |       |
|------------------------------|---------|-------|-------|--------|--------|-------|------|-------|
| Reel Option                  | D       | D1    | D2    | G      | H      | I     | W1   | W2    |
| 7" Dia                       | Ø180.00 | 60.00 | 13.00 | R78.00 | R25.60 | R6.50 | 9.50 | 13.10 |

| REEL     | Reel Size | Box        | Box Size(mm) | Carton      | Carton Size(mm) | G.W.(kg) |
|----------|-----------|------------|--------------|-------------|-----------------|----------|
| 3000 pcs | 7 inch    | 30,000 pcs | 203×203×195  | 120,000 pcs | 438×438×220     |          |