JIANGSU CHANGJIANG ELECTRONICS TECHNOLOGY CO., LTD

# SOT-23-6L Plastic-Encapsulate MOSFETS

## CJL6602 P-channel and N-channel Complementary MOSFETS

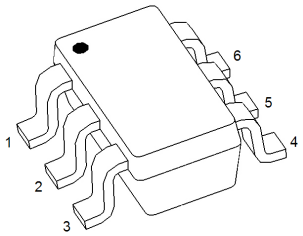
P-channel

| $V_{(BR)DSS}$ | $R_{DS(on)}$MAX | $I_D$ |
|---|---|---|
| -30V | 135mΩ@-10V | -2.3A |
| | 185mΩ@-4.5V | |
| | 265mΩ@-2.5V | |

N-channel

| $V_{(BR)DSS}$ | $R_{DS(on)}$MAX | $I_D$ |
|---|---|---|
| 30V | 60mΩ@10V | 3.4A |
| | 75mΩ@4.5V | |
| | 115mΩ@2.5V | |

SOT-23-6L

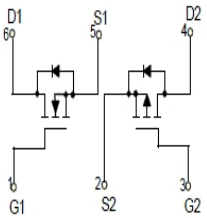



### GENERAL DESCRIPTION

The CJL6602 uses advanced trench technology to provide excellent $R_{DS(on)}$ and low gate charge. The complementary MOSFETS form a high-speed power inverter and suitable for a multitude of applications.

### MARKING


### Equivalent Circuit




### Maximum Ratings ($T_A$=25℃ unless otherwise noted)

| Parameter | Symbol | Value | | Unit |
|---|---|---|---|---|
| | | N-channel | P-channel | |
| **Drain-Source Voltage** | $V_{DS}$ | 30 | -30 | V |
| **Gate-Source Voltage** | $V_{GS}$ | ±12 | ±12 | V |
| **Continuous Drain Current**(1) | $I_D$ | 3.4 | -2.3 | A |
| **Pulsed Drain Current** (2) | $I_{DM}$ | 30 | -30 | A |
| **Power Dissipation** | $P_D$ | 0.35 | 0.35 | W |
| **Thermal Resistance from Junction to Ambient**(1) | $R_{\theta JA}$ | 357 | 357 | ℃/W |
| **Junction Temperature** | $T_J$ | 150 | 150 | ℃ |
| **Storage Temperature** | $T_{stg}$ | -55~+150 | -55~+150 | ℃ |

1.The value of $R_{\theta JA}$ is measured with the device mounted on 1in$^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A$=25°C. The value in any given application depends on the user's specific board design.The current ratings is based on t≤10s thermal rasistance rating.

2. Repetitive rating,pulse with limited by junction temperature.

# MOSFET ELECTRICAL CHARACTERISTICS

### N-channel MOSFET Electrical Characteristics ($T_A$=25℃ unless otherwise noted)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static characteristics** | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)\ DSS}$ | $V_{GS}$ = 0V, $I_D$ =250μA | 30 | | | V |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$ =24V,$V_{GS}$ = 0V | | | 1 | μA |
| Gate-source leakage current (note1) | $I_{GSS}$ | $V_{GS}$ =±12V, $V_{DS}$ = 0V | | | ±100 | nA |
| Drain-source on-resistance (note1) | $R_{DS(on)}$ | $V_{GS}$ =10V, $I_D$ =3A | | 45 | 60 | mΩ |
| | | $V_{GS}$ =4.5V, $I_D$ =3A | | 50 | 75 | mΩ |
| | | $V_{GS}$ =2.5V, $I_D$ =2A | | 60 | 115 | mΩ |
| Forward tranconductance (note1) | $g_{FS}$ | $V_{DS}$ =5V, $I_D$ =3A | 5 | | | S |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS}$ =$V_{GS}$, $I_D$ =250μA | 0.6 | | 1.4 | V |
| Diode forward voltage (note1) | $V_{SD}$ | $I_S$=1A,$V_{GS}$=0V | | | 1 | V |
| **Dynamic characteristics** (note2) | | | | | | |
| Input capacitance | $C_{iss}$ | $V_{GS}$ =0V,$V_{DS}$ =15V ,f =1MHz | | 390 | | pF |
| Output capacitance | $C_{oss}$ | | | 54.5 | | pF |
| Reverse transfer capacitance | $C_{rss}$ | | | 41 | | pF |
| Gate resistance | $R_g$ | $V_{GS}$ =0V,$V_{DS}$ =0V,f =1MHz | | 3 | | Ω |
| **Switching Characteristics**(note2) | | | | | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{GS}$=10V,$V_{DS}$=15V, $R_L$=5Ω,$R_{GEN}$=6Ω | | 4 | | ns |
| Turn-on rise time | $t_r$ | | | 2 | | ns |
| Turn-off delay time | $t_{d(off)}$ | | | 22 | | ns |
| Turn-off fall time | $t_f$ | | | 3 | | ns |

### P-channel MOSFET Electrical Characteristics ($T_A$=25℃ unless otherwise noted)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static characteristics** | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)\ DSS}$ | $V_{GS}$ = 0V, $I_D$ =-250μA | -30 | | | V |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$ =-24V,$V_{GS}$ = 0V | | | -1 | μA |
| Gate-source leakage current | $I_{GSS}$ | $V_{GS}$ =±12V, $V_{DS}$ = 0V | | | ±100 | nA |
| Drain-source on-resistance (note1) | $R_{DS(on)}$ | $V_{GS}$ =-10V, $I_D$ =-2.3A | | 75 | 135 | mΩ |
| | | $V_{GS}$ =-4.5V, $I_D$ =-2A | | 95 | 185 | mΩ |
| | | $V_{GS}$ =-2.5V, $I_D$ =-1A | | 140 | 265 | mΩ |
| Forward tranconductance (note1) | $g_{FS}$ | $V_{DS}$ =-5V, $I_D$ =-2.3A | 4.5 | | | S |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS}$ =$V_{GS}$, $I_D$ =-250μA | -0.6 | | -1.4 | V |
| Diode forward voltage (note1) | $V_{DS}$ | $I_S$=-1A,$V_{GS}$=0V | | | -1 | V |
| **Dynamic characteristics** (note2) | | | | | | |
| Input capacitance | $C_{iss}$ | $V_{GS}$ =0V,$V_{DS}$ =-15V,f =1MHz | | 409 | | pF |
| Output capacitance | $C_{oss}$ | | | 55 | | pF |
| Reverse transfer capacitance | $C_{rss}$ | | | 42 | | pF |
| Gate resistance | $R_g$ | $V_{GS}$ =0V,$V_{DS}$ =0V,f =1MHz | | 12 | | Ω |
| **Switching Characteristics** (note2) | | | | | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{GS}$=-10V,$V_{DS}$=-15V, $R_L$=6Ω,$R_{GEN}$=6Ω | | 13 | | ns |
| Turn-on rise time | $t_r$ | | | 10 | | ns |
| Turn-off delay time | $t_{d(off)}$ | | | 28 | | ns |
| Turn-off fall time | $t_f$ | | | 13 | | ns |

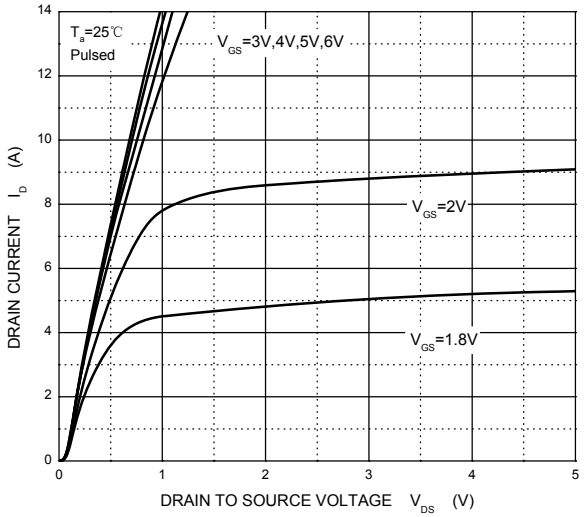
**Notes :** 1. Pulse Test : Pulse width≤300μs, duty cycle≤0.5%.

2. Guaranteed by design, not subject to production testing.

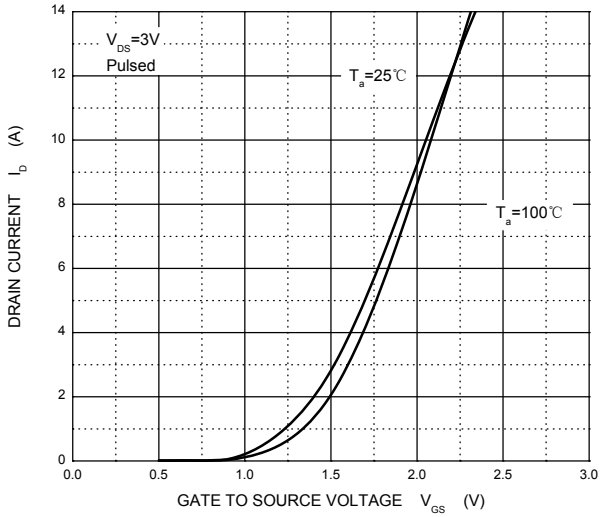
## Typical Characteristics

N-Channel-MOS

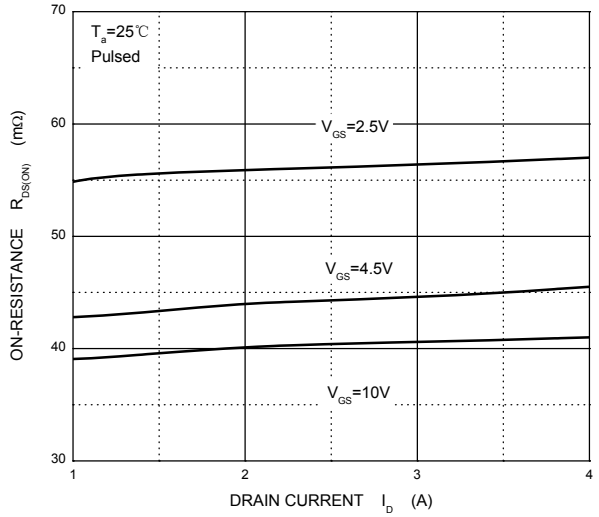
**Output Characteristics**



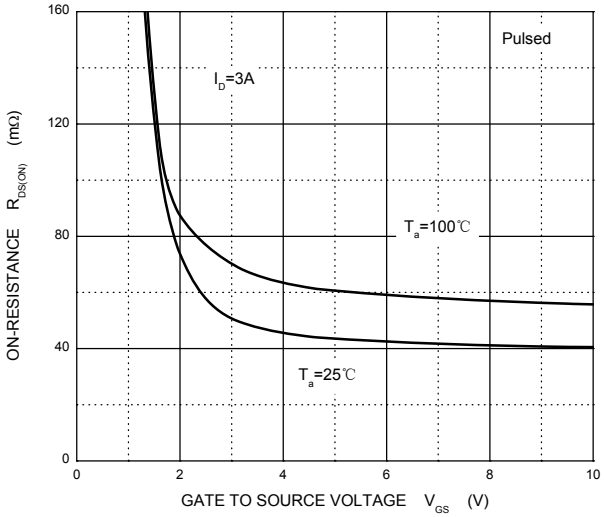

**Transfer Characteristics**



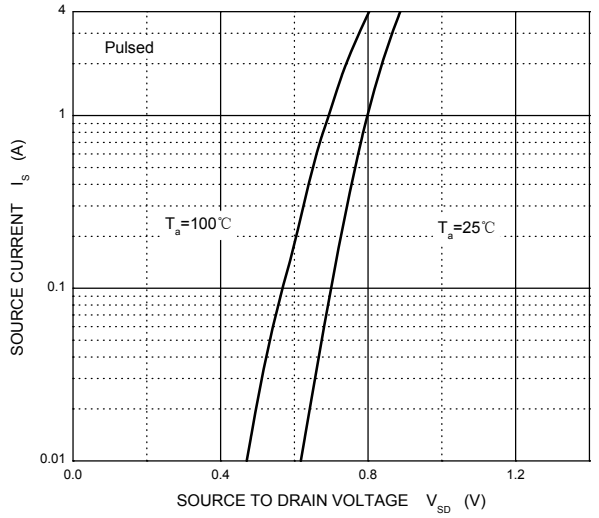

**$R_{DS(ON)}$ —— $I_D$**



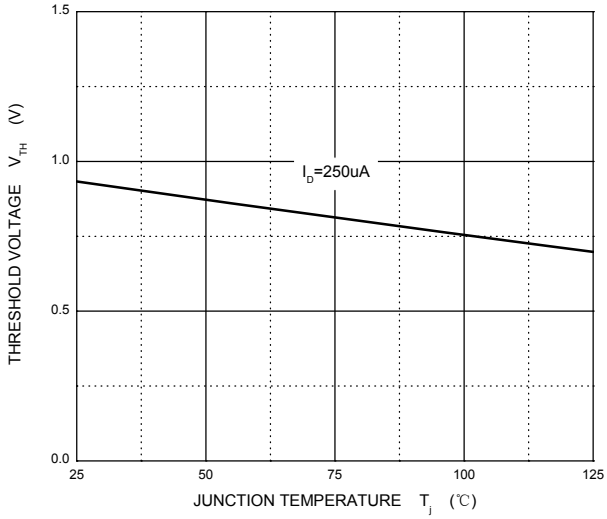

**$R_{DS(ON)}$ —— $V_{GS}$**




**$I_S$ —— $V_{SD}$**



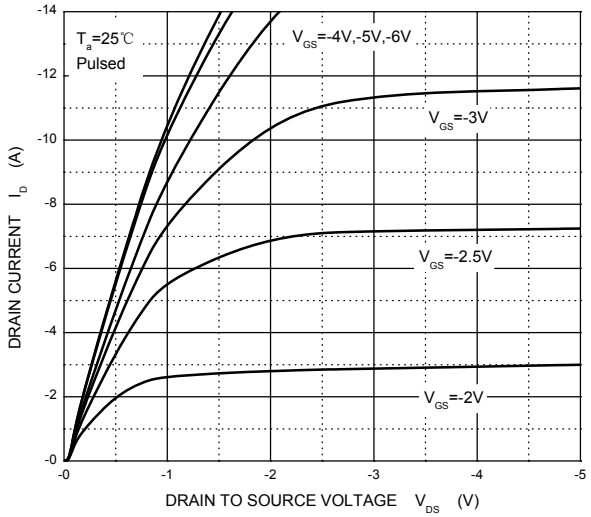

**Threshold Voltage**



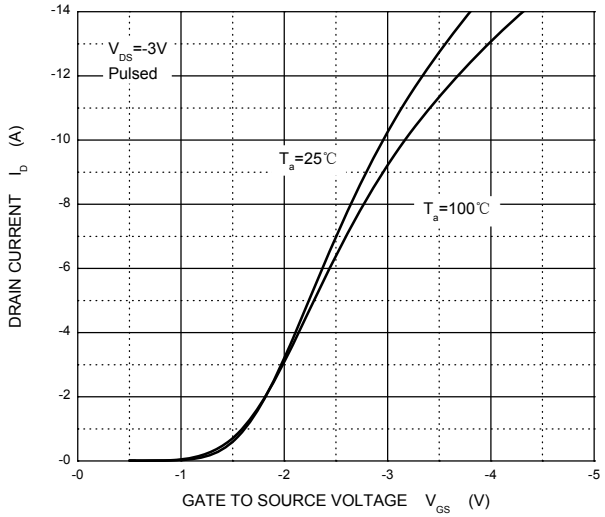
## Typical Characteristics

P-Channel-MOS

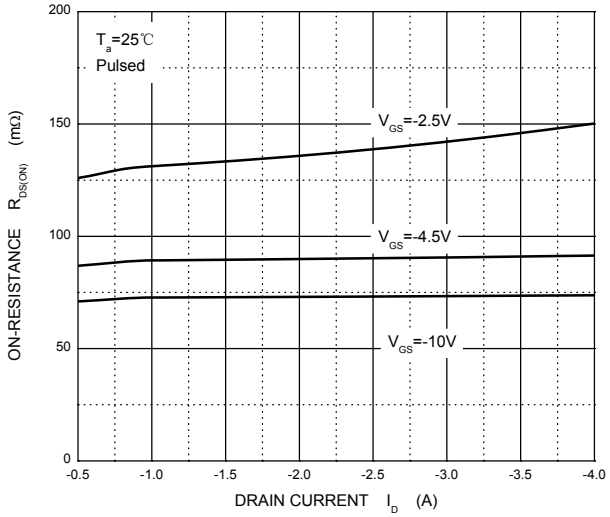
**Output Characteristics**



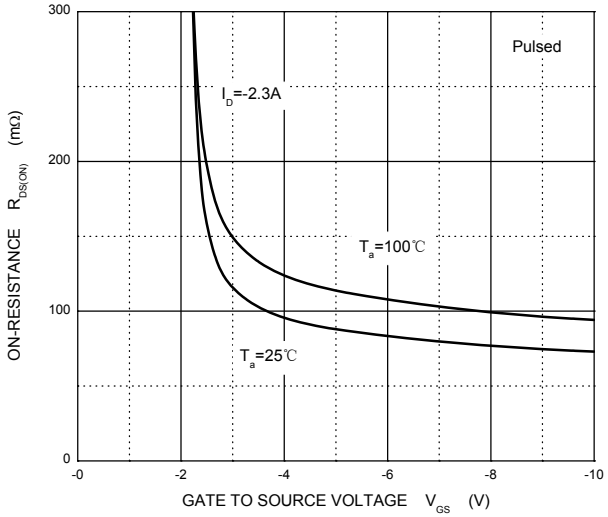

**Transfer Characteristics**



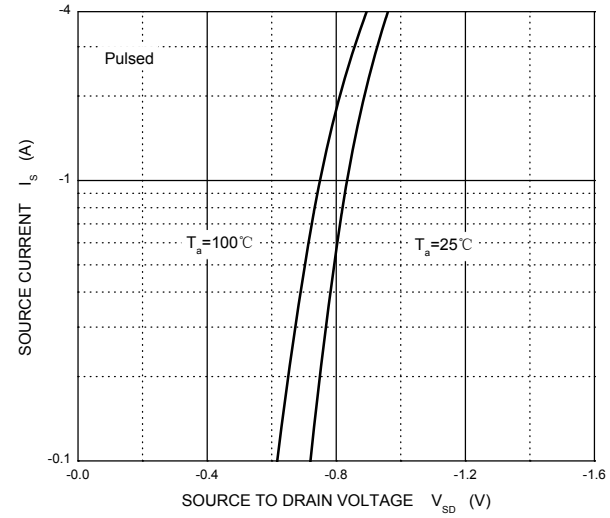

**$R_{DS(ON)}$ —— $I_D$**



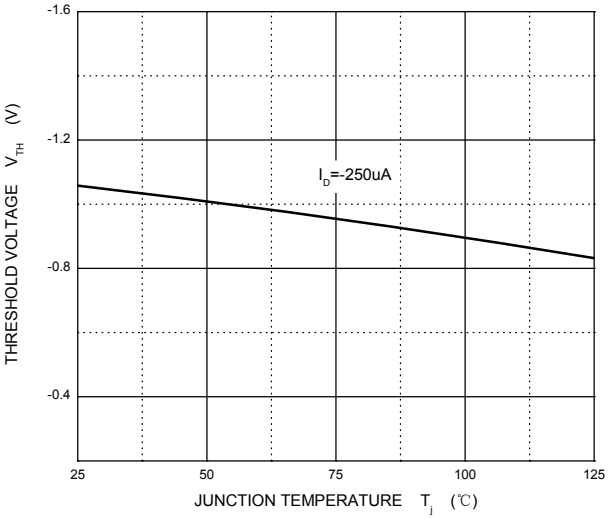

**$R_{DS(ON)}$ —— $V_{GS}$**



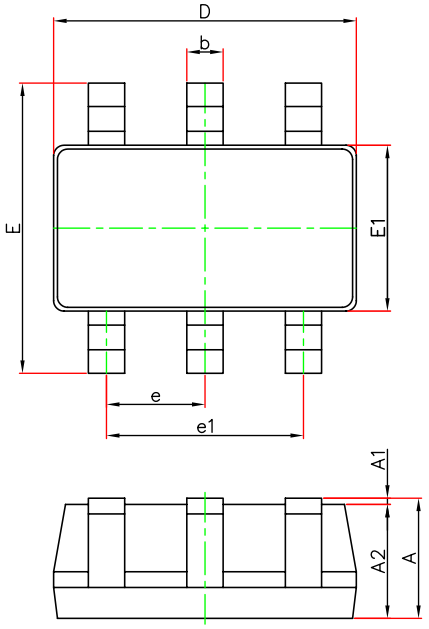

**$I_S$ —— $V_{SD}$**

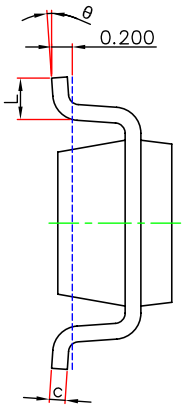



**Threshold Voltage**



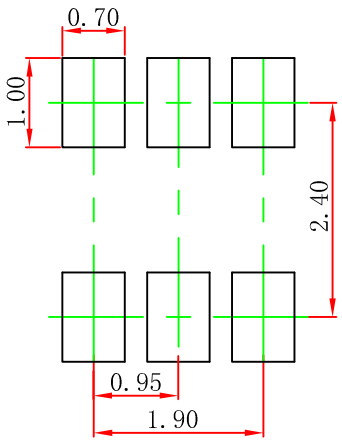
## SOT-23-6L Package Outline Dimensions




| 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 |
| θ | 0° | 8° | 0° | 8° |

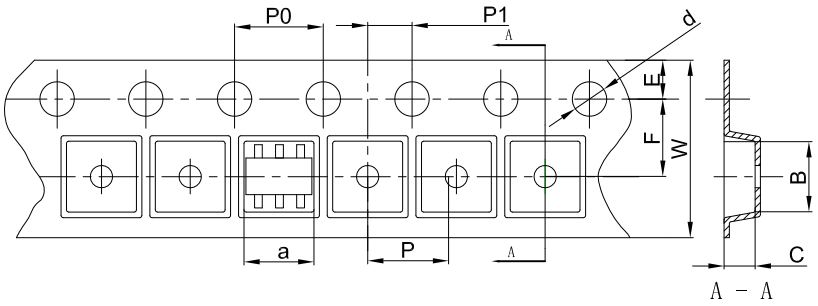
## SOT-23-6L Suggested Pad Layout




Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

## SOT-23-6L Tape and Reel

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

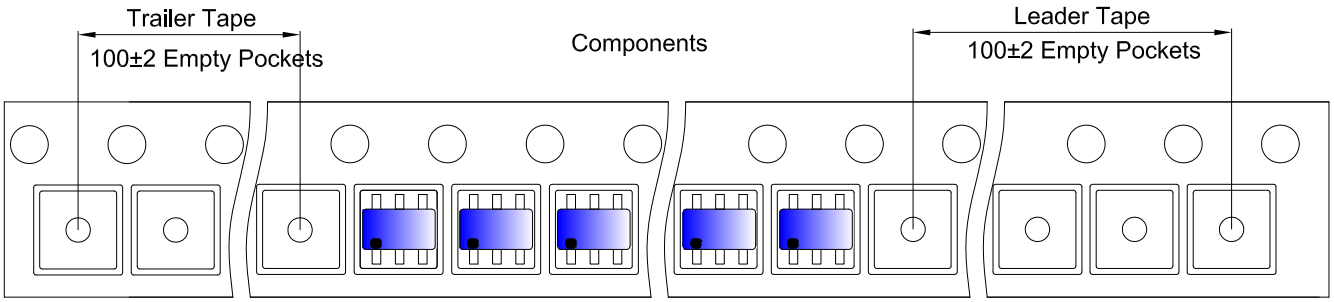



Packaging Description:

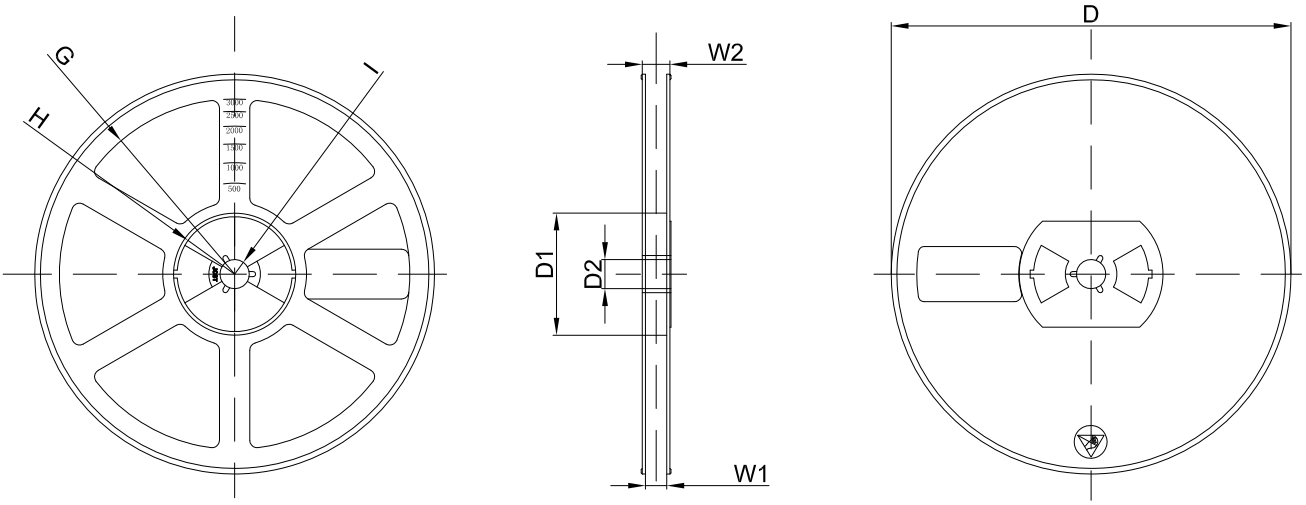
SOT-23-6L parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 18.0cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

| 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 | |