

## General Description



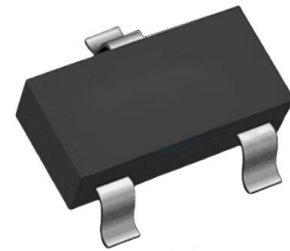
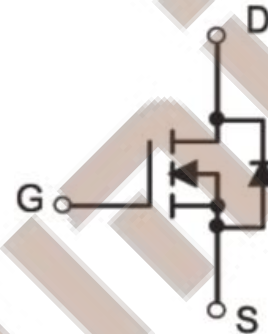
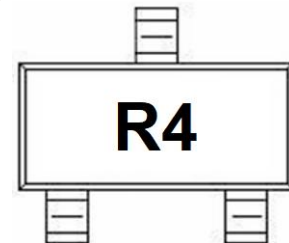
| $V_{(BR)DSS}$ | $R_{DS(ON) MAX}$ | $I_D Max.$ |
|---------------|------------------|------------|
| 30V           | 30mΩ@10V         | 5.8A       |
|               | 42mΩ@4.5V        |            |

## Features

- High density cell design for low RDS(ON)
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability
- Load Switch for Portable Devices
- DC/DC Converter

## Mechanical Data

- SOT-23-3L Small Outline Plastic Package.
- Epoxy UL: 94V-0.
- Mounting Position: Any.



## Package Marking and Ordering Information

| Product ID | Pack      | Marking | Qty(PCS) |
|------------|-----------|---------|----------|
| 3404       | SOT-23-3L | R4      | 3000     |

**Absolute Maximum Ratings (Ta=25°C unless otherwise noted)**

| Parameter                                            | Symbols | Value    | Units |
|------------------------------------------------------|---------|----------|-------|
| Drain-Source Voltage                                 | VDS     | 30       | V     |
| Gate-Source Voltage                                  | VGS     | ±20      | V     |
| Continuous Drain Current                             | ID      | 5.8      | A     |
| Drain Current-Pulsed(note 1)                         | IDM     | 30       |       |
| Junction Temperature                                 | Tj      | 150      | °C    |
| Storage Temperature                                  | Tstg    | -50-+150 | °C    |
| Thermal Resistance From Junction to Ambient (note 2) | R θ JA  | 357      | °C/W  |

**Electrical Characteristics (Tj=25°C,unless otherwise noted)**

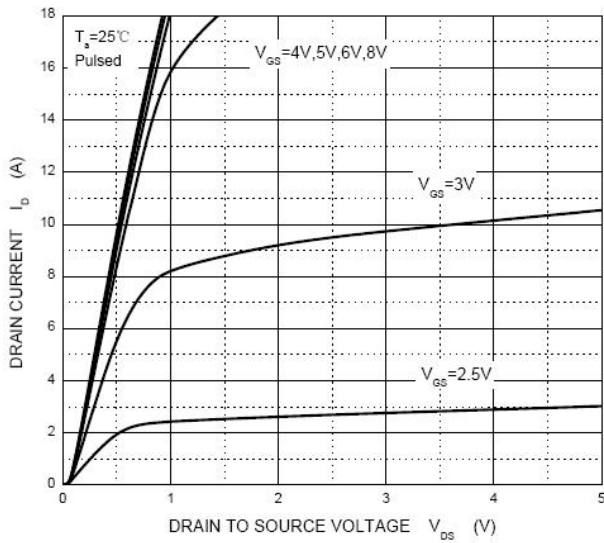
| Parameter                                              | Symbol    | Test Conditions                          | Min. | Typ  | Max. | Unit |
|--------------------------------------------------------|-----------|------------------------------------------|------|------|------|------|
| Off characteristics                                    |           |                                          |      |      |      |      |
| Drain-Source Breakdown Voltage                         | V(BR)DSS  | VGS=0V, ID=250uA                         | 30   |      |      | V    |
| Zero Gate Voltage Drain current                        | IDSS      | VDS=30V, VGS=0V                          |      |      | 1    | uA   |
| Gate-body Leakage                                      | IGSS      | VDS=±20V, VGS=0V                         |      |      | ±100 | nA   |
| On characteristics                                     |           |                                          |      |      |      |      |
| Drain-Source On-Resistance<br>(note 3)                 | RDS(ON)   | VGS=10V, ID=5.8A                         |      | 23   | 30   | m Ω  |
|                                                        |           | VGS=4.5V, ID=4.8A                        |      | 31   | 42   |      |
| Forward trans conductance                              | gfs       | VDS=5V, ID=5.8A                          | 5    |      |      | S    |
| Gate-Threshold voltage*                                | V GS (th) | VDS=VGS, ID=250uA                        | 1.0  | 1.4  | 3.0  | V    |
| Dynamic characteristics (note 4,5)                     |           |                                          |      |      |      |      |
| Input capacitance                                      | Ciss      | VDS=15V, VGS=0V,f=1MHz                   |      |      | 820  | pF   |
| Output capacitance                                     | Coss      |                                          |      | 118  |      |      |
| Reverse Transfer capacitance                           | Crss      |                                          |      | 85   |      |      |
| Gate resistance                                        | Rg        | VDS=0V, VGS=0V,f=1MHz                    |      |      | 1.5  | Ω    |
| Switching characteristics (note 4,5)                   |           |                                          |      |      |      |      |
| Turn-on Time                                           | td(on)    | VGS=10V, RL=2.6 Ω ,<br>VDS=15V, RGEN=3 Ω |      |      | 6.5  | ns   |
| Rise time                                              | tr        |                                          |      | 3.1  |      |      |
| Turn-off Time                                          | td(off)   |                                          |      | 15.1 |      |      |
| Fall time                                              | tf        |                                          |      | 2.7  |      |      |
| Drain-source diode characteristics and maximum ratings |           |                                          |      |      |      |      |
| Diode forward voltage                                  | VSD       | IS=1A, VGS=0V                            |      |      | 1.0  | V    |

Notes:

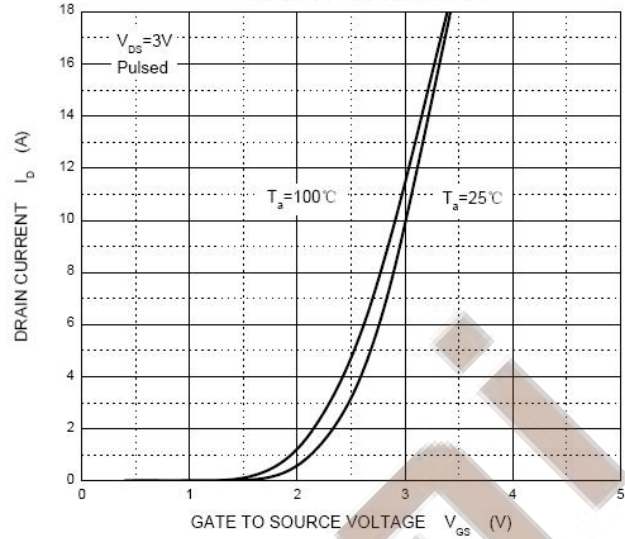
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t<5 sec.
3. Pulse Test: Pulse Width ≤300us, Duty Cycle≤0.5%.
4. Guaranteed by design, not subject to production testing.

## Typical Characteristics

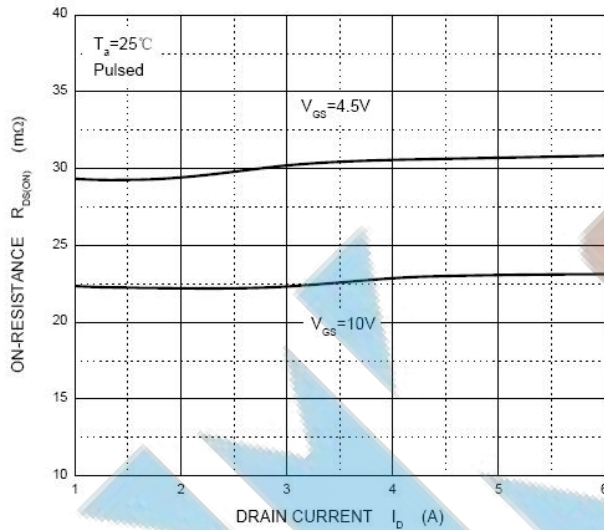
Output Characteristics



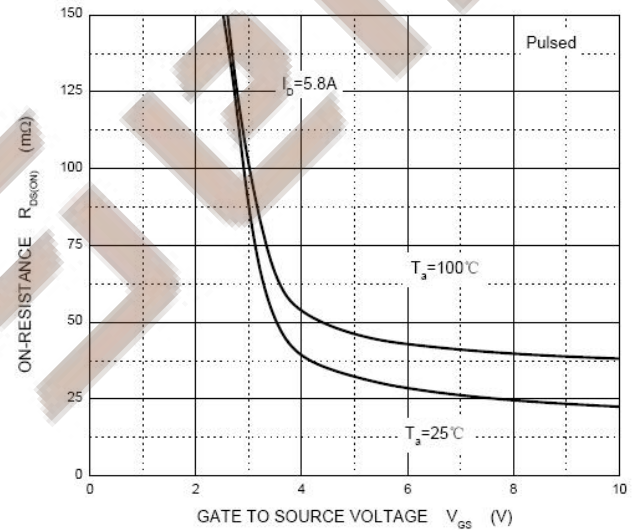
Transfer Characteristics



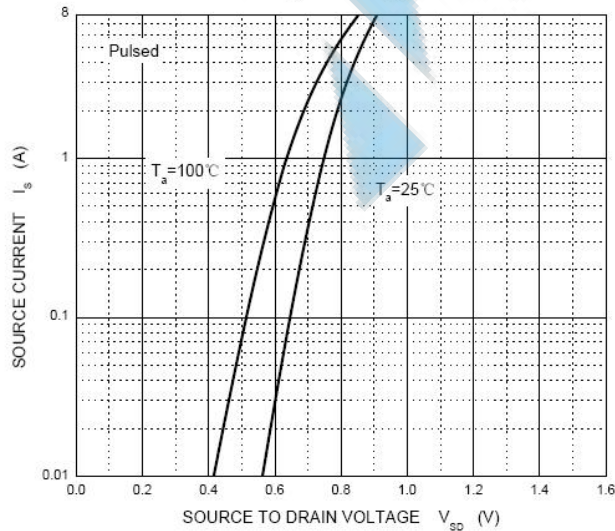
$R_{DS(ON)}$  —  $I_D$



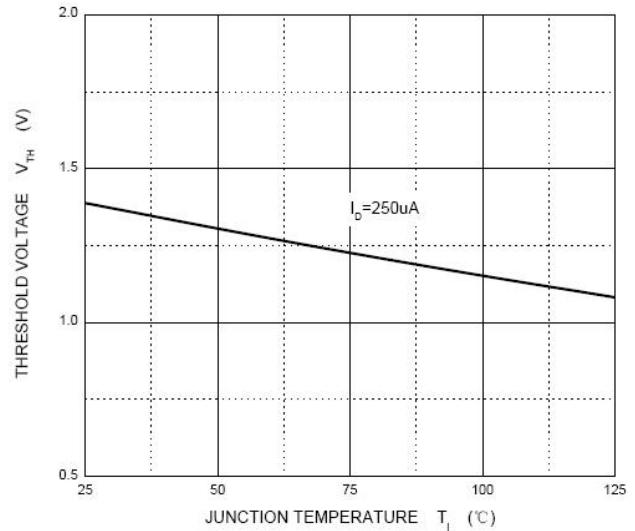
$R_{DS(ON)}$  —  $V_{GS}$



$I_S$  —  $V_{SD}$

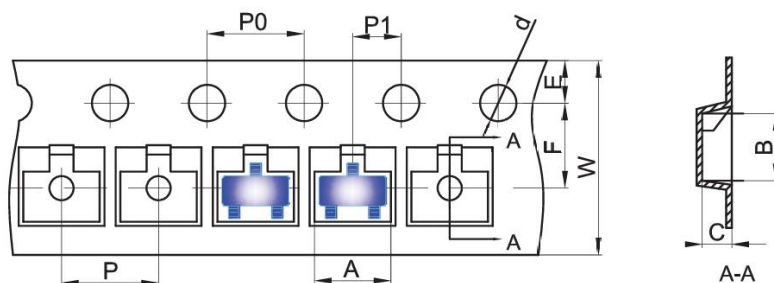


Threshold Voltage



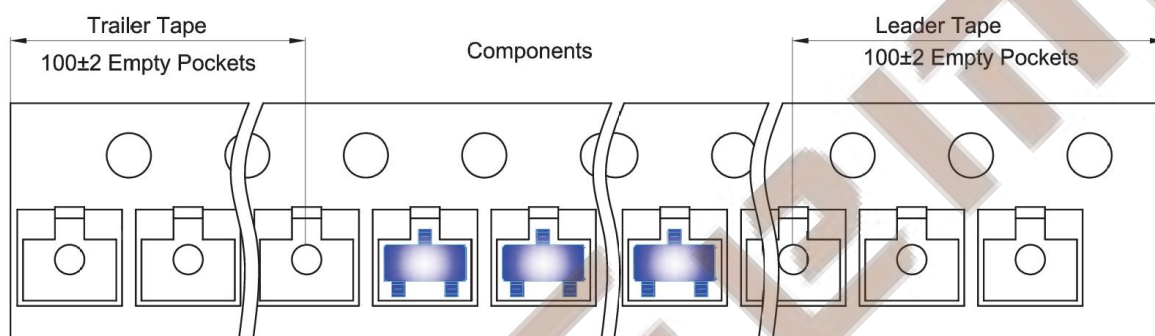
## Package Information

### Carrier Dimension(mm)

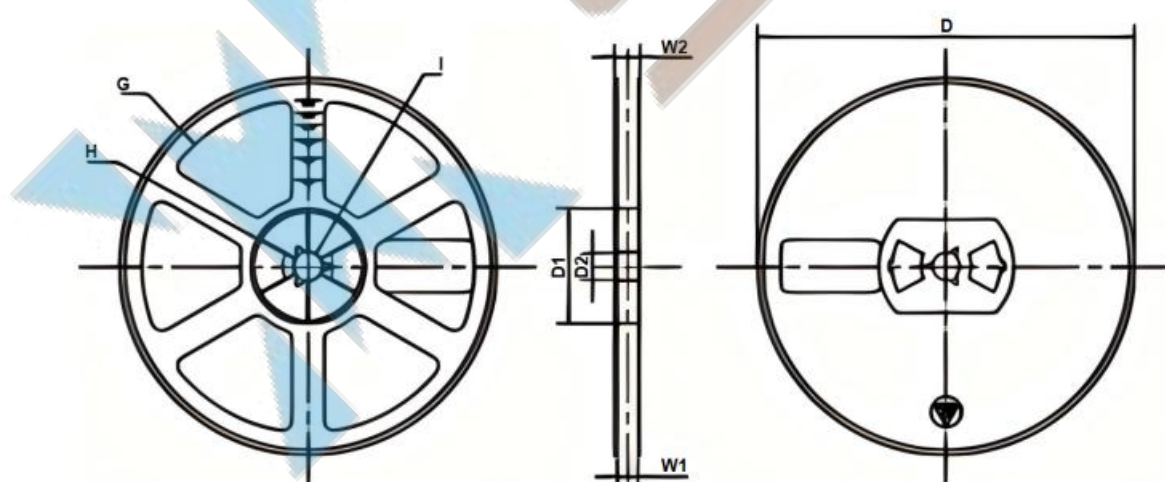


Dimensions are in millimeter

| Pkg Type  | A    | B    | C    | d     | E    | F    | P0   | P    | P1   | W    |
|-----------|------|------|------|-------|------|------|------|------|------|------|
| SOT-23-3L | 3.18 | 3.28 | 1.32 | Ø1.50 | 1.75 | 3.50 | 4.00 | 4.00 | 2.00 | 8.00 |



### Reel Dimension(mm)



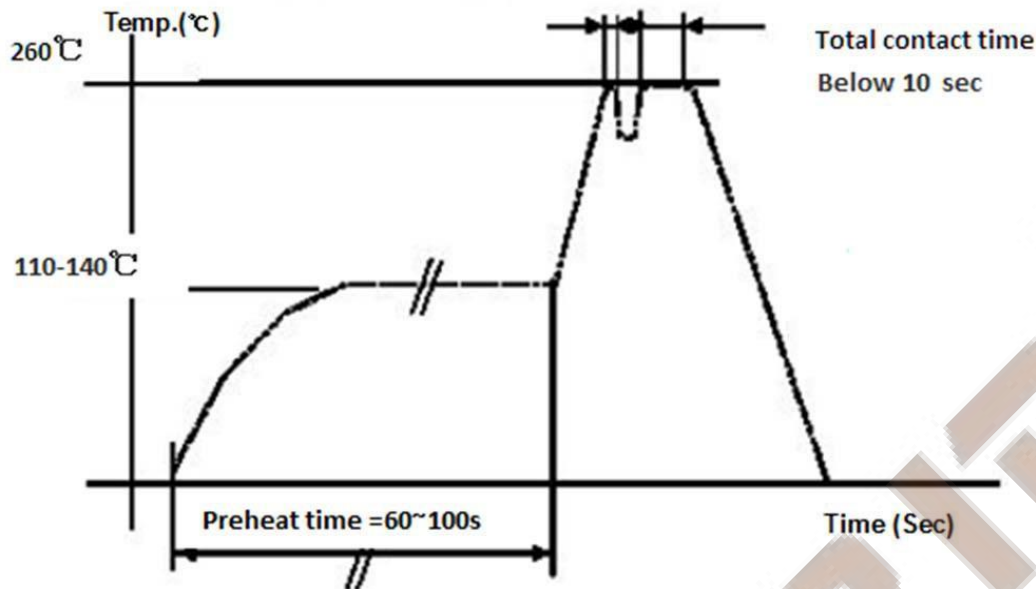
| Reel Option | D       | D1    | D2    | G      | H      | I     | W1   | W2    |
|-------------|---------|-------|-------|--------|--------|-------|------|-------|
| 7" Dia      | Φ178.00 | 54.40 | 13.00 | R78.00 | R25.60 | R6.50 | 9.50 | 12.30 |
| Tolerance   | ±2      | ±1    | ±1    | ±1     | ±1     | ±1    | ±1   | ±1    |

## Package Specifications

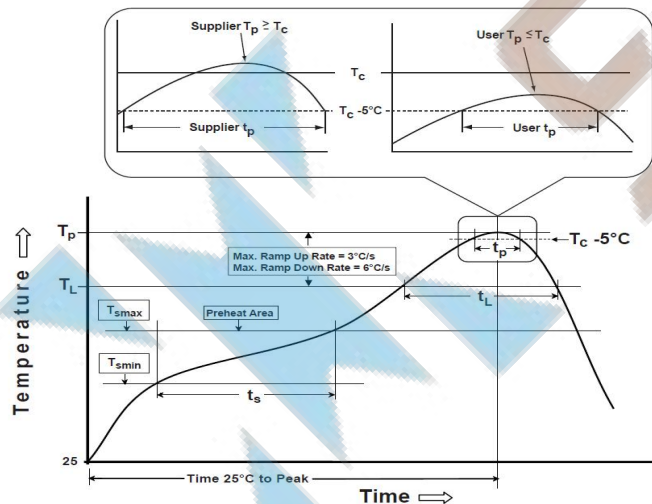
| Package   | Reel Size | Reel DIA.<br>(mm) | Q'TY/Reel<br>(Kpcs) | Box Size<br>(mm) | QTY/Box<br>(Kpcs) | Carton Size<br>(mm) | Q'TY/Carton<br>(Kpcs) |
|-----------|-----------|-------------------|---------------------|------------------|-------------------|---------------------|-----------------------|
| SOT-23-3L | 7'        | 178               | 3                   | 210*208*203      | 45                | 440*400*230         | 180                   |

## Recommended Soldering Profile for Rectifier Diodes (Pb Free)

### a) Wave Soldering Profile



### b) Reflow Soldering Profile (Pb Free Application), refer to IPC/JEDEC J-STD-020

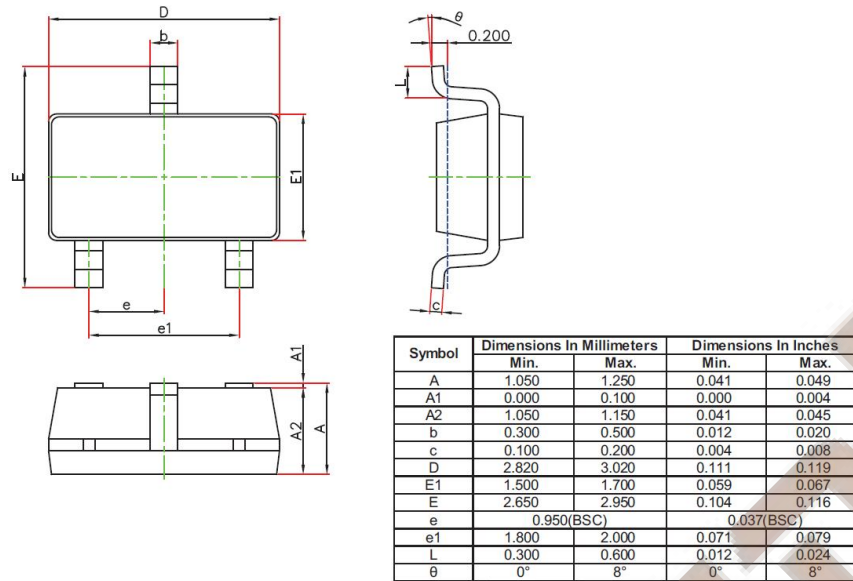


| Preheat/Soak Temperature Min (Tsmin) Temperature Max (Tsmax) Time (ts) from (Tsmin to Tsmax) | 50 °C<br>200 °C<br>60-120 seconds |
|----------------------------------------------------------------------------------------------|-----------------------------------|
| Melting Point of Solder (Sn Ag Cu)                                                           | 217°C                             |
| Ramp-up Rate to 217°C(Melting Point of Solder)                                               | 3°C/sec                           |
| Time at Temp.>217°C (Melting Point of Solder)                                                | 60~150 Sec                        |
| Peak Temperature                                                                             | 255±5°C                           |
| Time within 5°Cbelow Peak Temp.                                                              | 20~40 Sec                         |
| Cooling Rate                                                                                 | 6°C/sec (max)                     |
| Time from 25°C to Peak Temp.                                                                 | 8min (max)                        |

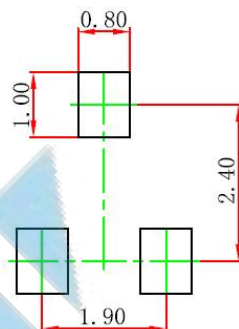
### c) Manual Soldering

When using an electric soldering iron for manual soldering, it is recommended that the temperature does not exceed 300°C and the soldering time is less than 10 seconds.

## Package Mechanical Data



## Suggested Pad Layout



Note:  
1. Controlling dimension: in millimeters.  
2. General tolerance:  $\pm 0.05\text{mm}$ .  
3. The pad layout is for reference purposes only.

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