

## PRODUCT CHARACTERISTICS

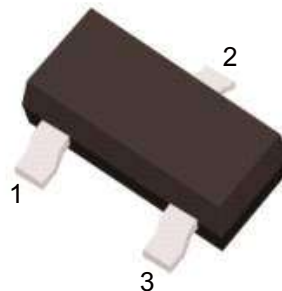
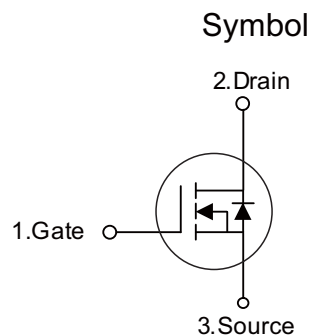
|                                 |              |
|---------------------------------|--------------|
| VDSS                            | 20V          |
| $R_{DS(on)Typ}(V_{GS} @=4.5V)$  | 21m $\Omega$ |
| $R_{DS(on)Typ}(V_{GS} @=2.5 V)$ | 25m $\Omega$ |
| ID                              | 4.5A         |

## APPLICATION

Battery switch  
DC/DC converter

## FEATURE

High power and current handing capability  
Lead free product is acquired  
Surface mount package



## ORDER INFORMATION

| Order codes  |           | Package | Packing         |
|--------------|-----------|---------|-----------------|
| Halogen-Free | Halogen   |         |                 |
| N/A          | MOT2300B2 | SOT-23  | 3000pieces/Reel |

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

| Parameter                                        | Symbol         | Rating     | Unit               |
|--------------------------------------------------|----------------|------------|--------------------|
| Drain-Source Voltage                             | $V_{DS}$       | 20         | V                  |
| Gate-Source Voltage                              | $V_{GS}$       | $\pm 12$   | V                  |
| Drain Current-Continuous                         | $I_D$          | 4.5        | A                  |
| Drain Current-Pulsed                             | $I_{DM}$       | 18         | A                  |
| Maximum Power Dissipation                        | $P_D$          | 1.25       | W                  |
| Operating Junction and Storage Temperature Range | $T_J, T_{STG}$ | -55 To 150 | $^{\circ}\text{C}$ |

**■ ELECTRICAL CHARACTERISTICS** (  $T_C=25^{\circ}\text{C}$ , unless otherwise specified)

| Parameter                        | Symbol       | Condition                                                | Min | Typ  | Max       | Unit       |
|----------------------------------|--------------|----------------------------------------------------------|-----|------|-----------|------------|
| Off characteristics              |              |                                                          |     |      |           |            |
| Drain-Source Breakdown Voltage   | $BV_{DSS}$   | $V_{GS}=0V, I_D=250\mu A$                                | 20  | -    | -         | V          |
| Zero Gate Voltage Drain Current  | $I_{DSS}$    | $V_{DS}=20V, V_{GS}=0V$                                  | -   | -    | 1         | $\mu A$    |
| Gate-Body Leakage Current        | $I_{GSS}$    | $V_{GS}=\pm 12V, V_{DS}=0V$                              | -   | -    | $\pm 100$ | nA         |
|                                  |              |                                                          |     |      |           |            |
| Gate Threshold Voltage           | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$                            | 0.5 | -    | 1.2       | V          |
| Drain-Source On-State Resistance | $R_{DS(ON)}$ | $V_{GS}=4.5V, I_D=2.5A$                                  | -   | 21   | 28        | m $\Omega$ |
|                                  |              | $V_{GS}=2.5V, I_D=2.5A$                                  | -   | 25   | 32        | m $\Omega$ |
| Forward Transconductance         | $g_{FS}$     | $V_{DS}=5V, I_D=3A$                                      | 3   | -    | -         | S          |
| Dynamic characteristics          |              |                                                          |     |      |           |            |
| Input Capacitance                | $C_{iss}$    | $V_{DS}=10V, V_{GS}=0V,$<br>$F=1.0MHz$                   | -   | 637  | -         | pF         |
| Output Capacitance               | $C_{oss}$    |                                                          | -   | 133  | -         | pF         |
| Reverse Transfer Capacitance     | $C_{rss}$    |                                                          | -   | 124  | -         | pF         |
| Switching characteristics        |              |                                                          |     |      |           |            |
| Turn-on Delay Time               | $t_{d(on)}$  | $V_{DD}=10V, I_D=2.5A$<br>$V_{GS}=4.5V, R_{GEN}=6\Omega$ | -   | 11   | -         | nS         |
| Turn-on Rise Time                | $t_r$        |                                                          | -   | 30   | -         | nS         |
| Turn-Off Delay Time              | $t_{d(off)}$ |                                                          | -   | 35   | -         | nS         |
| Turn-Off Fall Time               | $t_f$        |                                                          | -   | 10   | -         | nS         |
| Total Gate Charge                | $Q_g$        | $V_{DS}=10V, I_D=2.5A,$<br>$V_{GS}=4.5V$                 | -   | 11.1 | -         | nC         |
| Gate-Source Charge               | $Q_{gs}$     |                                                          | -   | 1.1  | -         | nC         |
| Gate-Drain Charge                | $Q_{gd}$     |                                                          | -   | 3.4  | -         | nC         |
| Dain-source diodecharacteristics |              |                                                          |     |      |           |            |
| Diode Forward Voltage            | $V_{SD}$     | $V_{GS}=0V, I_S=2.5A$                                    | -   | -    | 1.2       | V          |
| Diode Forward Current            | $I_S$        |                                                          | -   | -    | 4.5       | A          |

■ TYPICAL CHARACTERISTICS

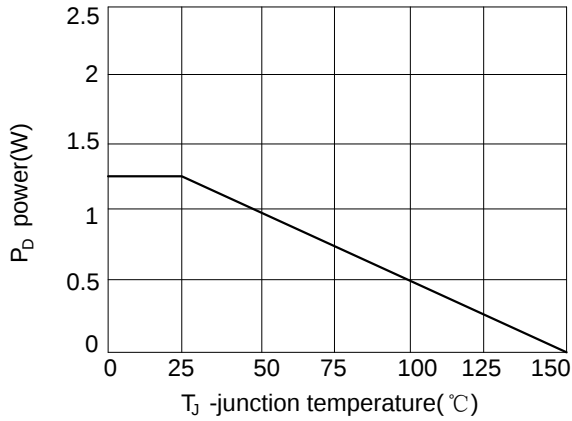


Figure 1 Power dissipation

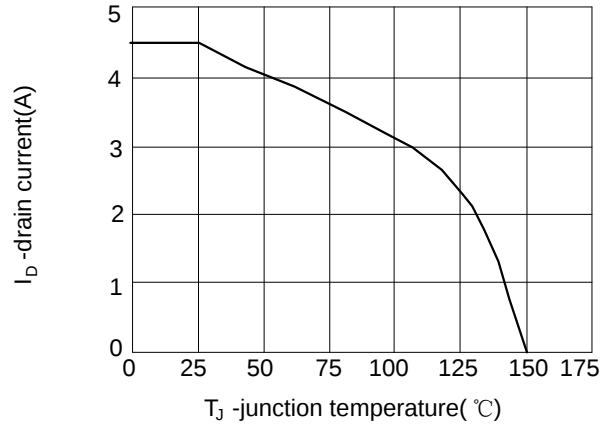


Figure 2 Drain current

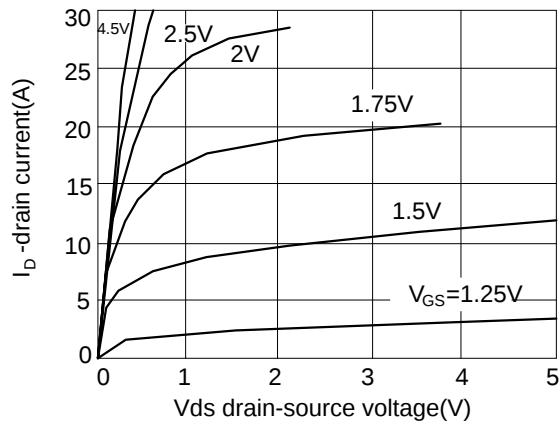


Figure 3 Output characteristics

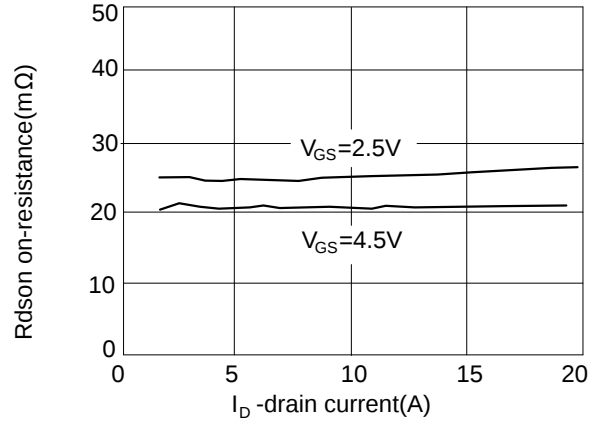


Figure 4 Drain-source on-resistance

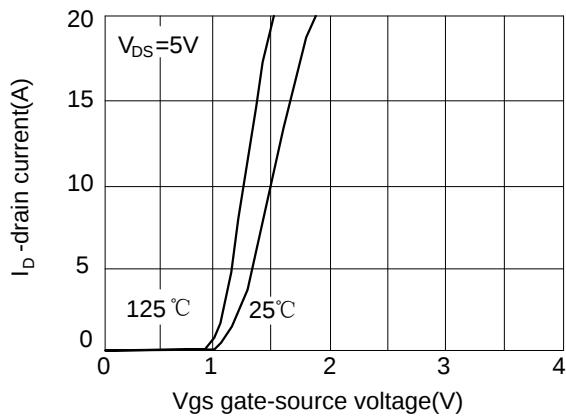


Figure 5 Transfer characteristics

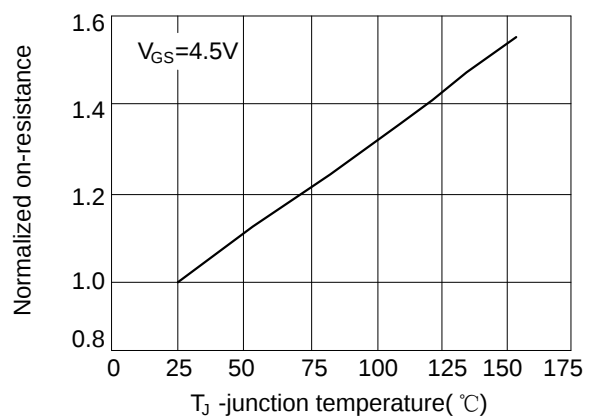


Figure 6 Drain source on-resistance

■ TYPICAL CHARACTERISTICS(Cont.)

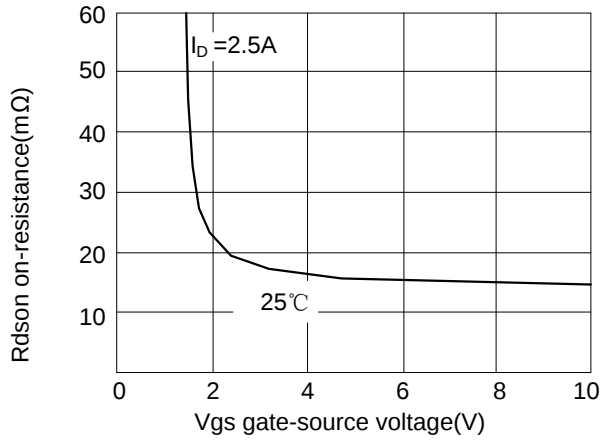


Figure 7 Rdson vs vgs

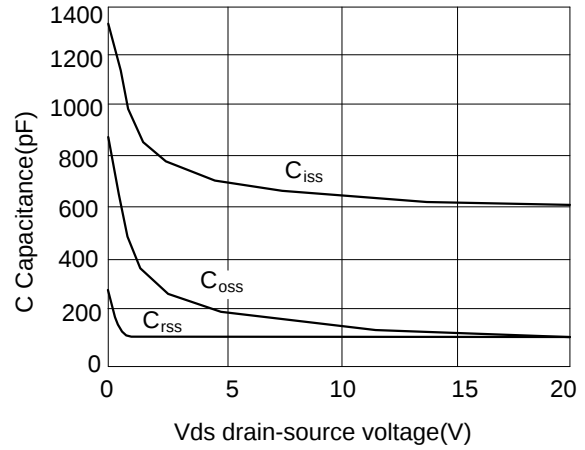


Figure 8 Capacitance vs vds

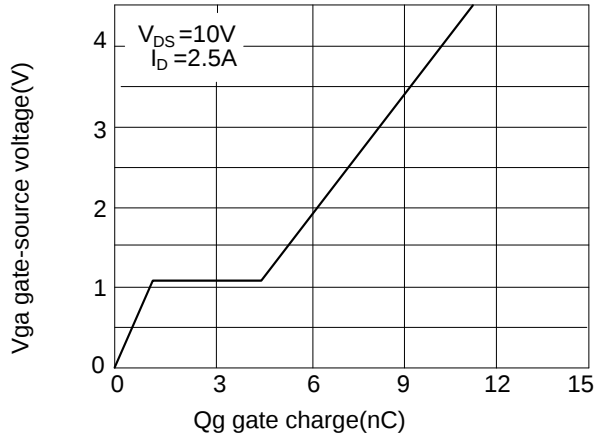


Figure 9 Gate charge

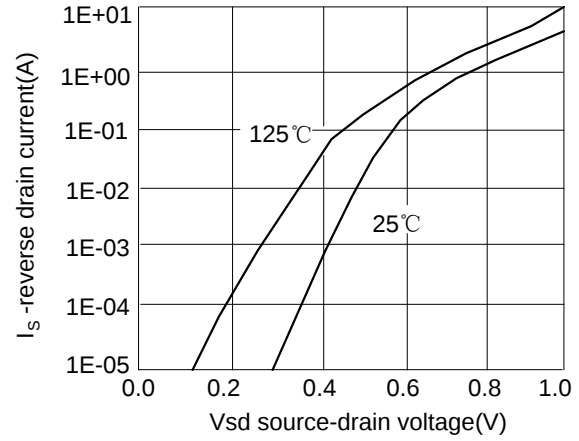


Figure 10 Source-drain diode forward

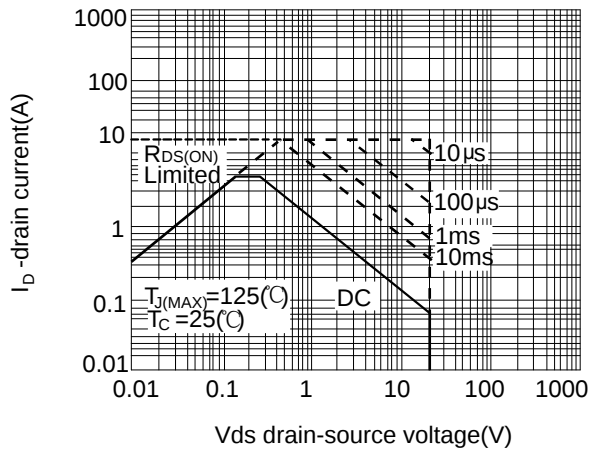
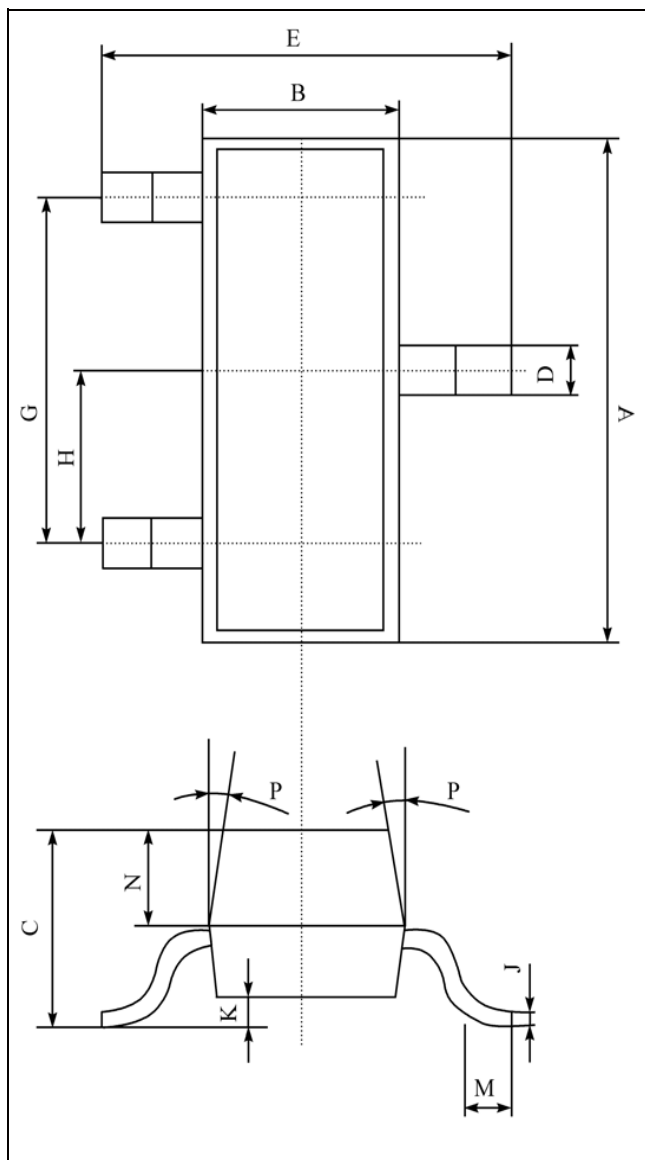


Figure 11 Safe operation area

■ SOT-23 PACKAGE OUTLINE DIMENSIONS

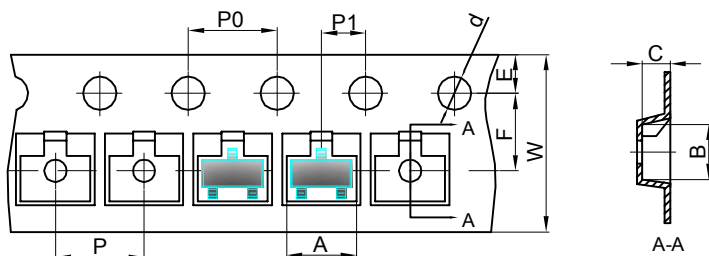


单位 (UNIT) : mm

| 序号                                                                                                                                                                    | 数值及公差     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| A                                                                                                                                                                     | 2.90±0.10 |
| B                                                                                                                                                                     | 1.30±0.10 |
| C                                                                                                                                                                     | 1.00±0.10 |
| D                                                                                                                                                                     | 0.40±0.10 |
| E                                                                                                                                                                     | 2.40±0.20 |
| G                                                                                                                                                                     | 1.90±0.10 |
| H                                                                                                                                                                     | 0.95±0.05 |
| J                                                                                                                                                                     | 0.13±0.05 |
| K                                                                                                                                                                     | 0.00-0.10 |
| M                                                                                                                                                                     | ≥0.20     |
| N                                                                                                                                                                     | 0.60±0.10 |
| P                                                                                                                                                                     | 7±2°      |
| Packing<br>SOT-23 包装规格<br>SMD片式表面贴封装<br>包装方式: 载带卷盘包装<br>Tape & Reel, 3Kpcs/Reel<br>每卷数量3000只 (3Kpcs/Reel)<br>每盒数量45000只 (45Kpcs/BOX)<br>每箱数量180000只 (180Kpcs/Cartons) |           |

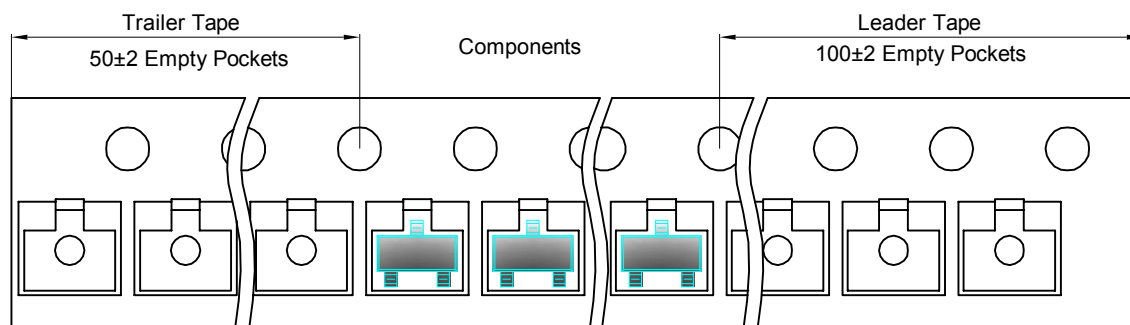
## SOT-23 Tape and reel

### SOT-23 Embossed Carrier Tape

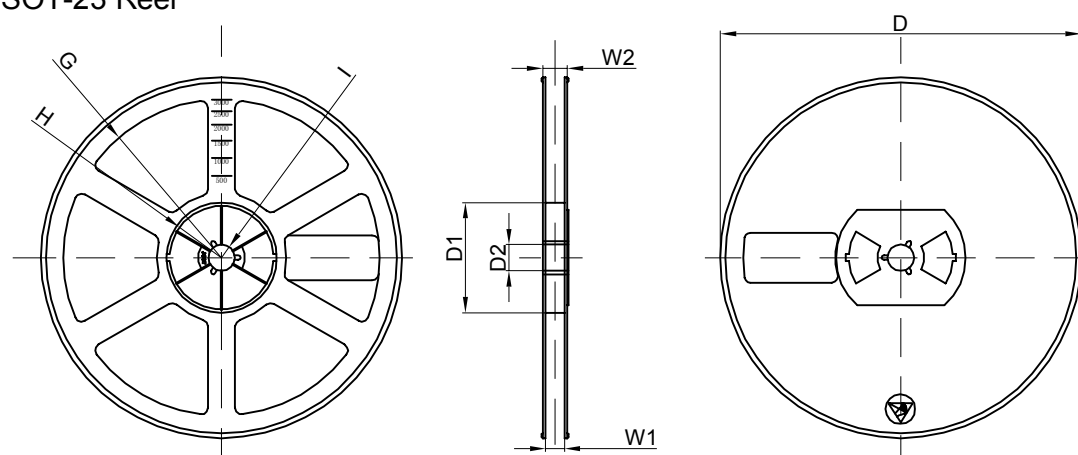


| Dimensions are in millimeter |      |      |      |       |      |      |      |      |      |      |
|------------------------------|------|------|------|-------|------|------|------|------|------|------|
| Pkg type                     | A    | B    | C    | d     | E    | F    | P0   | P    | P1   | W    |
| SOT-23                       | 3.15 | 2.77 | 1.22 | Ø1.50 | 1.75 | 3.50 | 4.00 | 4.00 | 2.00 | 8.00 |

### SOT-23 Tape Leader and Trailer



### SOT-23 Reel



| Dimensions are in millimeter |         |       |       |        |        |       |      |       |
|------------------------------|---------|-------|-------|--------|--------|-------|------|-------|
| Reel Option                  | D       | D1    | D2    | G      | H      | I     | W1   | W2    |
| 7" Dia                       | Ø178.00 | 54.40 | 13.00 | R78.00 | R25.60 | R6.50 | 9.50 | 12.30 |

| REEL     | Reel Size | Box        | Box Size(mm) | Carton      | Carton Size(mm) | G.W.(kg) |
|----------|-----------|------------|--------------|-------------|-----------------|----------|
| 3000 pcs | 7 inch    | 45,000 pcs | 192×192×193  | 180,000 pcs | 404×404×214     |          |