

## BC3400R1

### N-Channel Enhancement Mode MOSFET

The **BC3400R1** uses advanced trench technology to provide excellent  $R_{DS(on)}$ . This device is suitable for use as a load switch application.

#### Features and Benefits:

- Low On-Resistance
- High Dense Design
- Reliable and Rugged

#### Applications:

- Battery management
- Portable appliances
- Load Switch

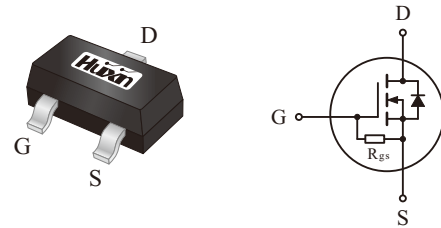
$$V_{DS} = 30V, I_D = 5.8A$$

$$R_{DS(on)} = 18.5m\Omega (V_{GS} = 10V, Typ)$$

$$R_{DS(on)} = 19.5m\Omega (V_{GS} = 4.5V, Typ)$$

$$V_{GS(th)} = 0.8V (Typ)$$

#### Package & Pin information



**SOT-23**

#### Package Information

| Product Name | Package | Packing   | Qty.    |
|--------------|---------|-----------|---------|
| BC3400R1     | SOT-23  | Tape&Reel | 3000PCS |

#### Maximun Ratings ( $T_J=25^\circ C$ unless otherwise specified)

| Parameter                                           | Symbols         | Value      | Unit         |
|-----------------------------------------------------|-----------------|------------|--------------|
| Drain-Source Voltage                                | $V_{DSS}$       | 30         | V            |
| Gate-Source Voltage                                 | $V_{GS}$        | $\pm 12$   | V            |
| Continuous Drain Current, $V_{GS}=4.5V$             | $I_D$           | 5.8        | A            |
| Pulsed drain current (Note1)                        | $I_{DM}$        | 25         | A            |
| Power dissipation, $T_C=25^\circ C$                 | $P_D$           | 1000       | mW           |
| Thermal Resistance from Junction to Ambient (Note2) | $R_{\theta JA}$ | 125        | $^\circ C/W$ |
| Operating Junction and Storage Temperature          | $T_J, T_{STG}$  | -55 ~ +150 | $^\circ C$   |

Note:

(1) Repetitive Rating: Pulse width limited by maximum junction temperature.

(2) Surface Mounted on FR4 Board,  $t \leq 10$  sec.

(3) Pulse Test: Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .

## Electrical Characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise specified)

| Symbols       | Parameter                        | Min.      | Typ. | Max.      | Unit          | Test Conditions                                               |
|---------------|----------------------------------|-----------|------|-----------|---------------|---------------------------------------------------------------|
| $V_{(BR)DSS}$ | Drain-Source breakdown voltage   | 30        | —    | —         | V             | $V_{GS}=0, I_D=250\mu\text{A}$                                |
| $V_{GS(th)}$  | Gate threshold voltage           | 0.5       | 0.8  | 1.1       | V             | $V_{GS}=V_{DS}, I_D=250\mu\text{A}$                           |
| $R_{DS(on)}$  | Drain-Source on-State resistance | —         | 18.5 | 25.0      | m $\Omega$    | $V_{GS}=10\text{V}, I_D=5\text{A}$                            |
|               |                                  | —         | 19.5 | 26.0      | m $\Omega$    | $V_{GS}=4.5\text{V}, I_D=5\text{A}$                           |
| $I_{DSS}$     | Zero gate voltage drain current  | —         | —    | 1         | $\mu\text{A}$ | $V_{DS}=30\text{V}, V_{GS}=0, T_J=25^{\circ}\text{C}$         |
| $I_{GSS}$     | Gate-Source leakage current      | $\pm 100$ | —    | $\pm 300$ | $\mu\text{A}$ | $V_{DS}=0, V_{GS}=\pm 12\text{V}$                             |
| $C_{iss}$     | Input capacitance                | —         | 405  | —         | pF            | $V_{GS}=0$<br>$V_{DS}=15\text{V}$<br>$f=1\text{MHz}$          |
| $C_{oss}$     | Output capacitance               | —         | 40   | —         |               |                                                               |
| $C_{rss}$     | Reverse transfer capacitance     | —         | 38   | —         |               |                                                               |
| $Q_g$         | Total gate charge                | —         | 4.0  | —         | nC            | $V_{DS}=15\text{V}$<br>$V_{GS}=10\text{V}$<br>$I_D=5\text{A}$ |
| $Q_{gs}$      | Gate to source charge            | —         | 0.6  | —         |               |                                                               |
| $Q_{gd}$      | Gate to drain (Miller) charge    | —         | 1.5  | —         |               |                                                               |
| $R_G$         | Gate resistance                  | —         | 5    | —         | $\Omega$      | $f=1\text{MHz}$ , open drain                                  |
| $R_{GS}$      | Gate-Source pull-down resistor   | —         | 50   | —         | k $\Omega$    |                                                               |

## Body Diode Characteristics

| Symbols  | Parameter                  | Min. | Typ. | Max. | Unit | Test Conditions           |
|----------|----------------------------|------|------|------|------|---------------------------|
| $V_{SD}$ | Diode Forward Voltage      | —    | —    | 1.2  | V    | $V_{GS}=0, I_S=5\text{A}$ |
| $I_{SD}$ | Body Diode Forward Current | —    | —    | 5.0  | A    |                           |

## Electrical Characteristics Diagrams

Fig1. Typ. output characteristics

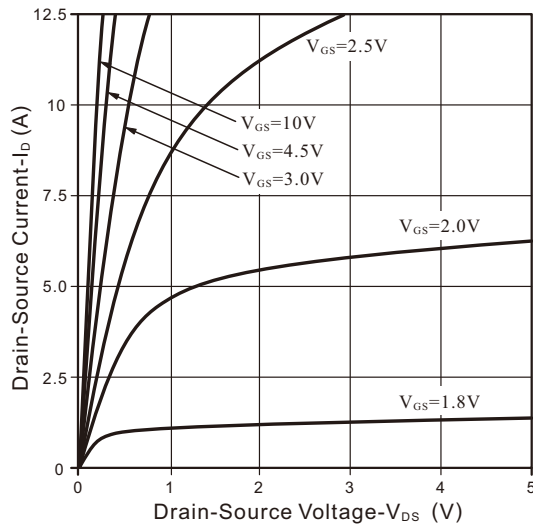


Fig2. Transfer Characteristic

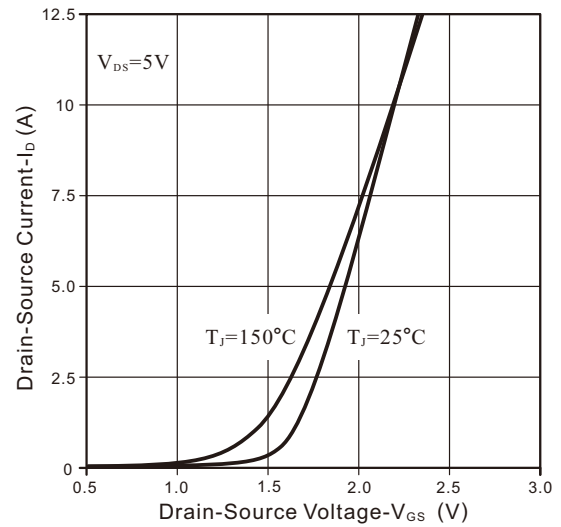


Fig3. On-Resistance vs. Drain Current

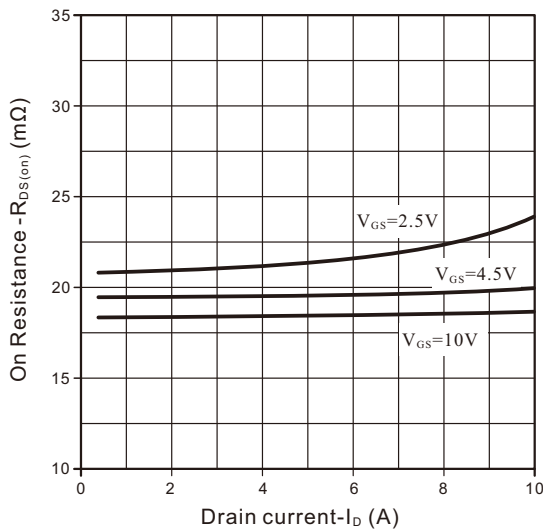


Fig4. On-Resistance vs.  $T_J$

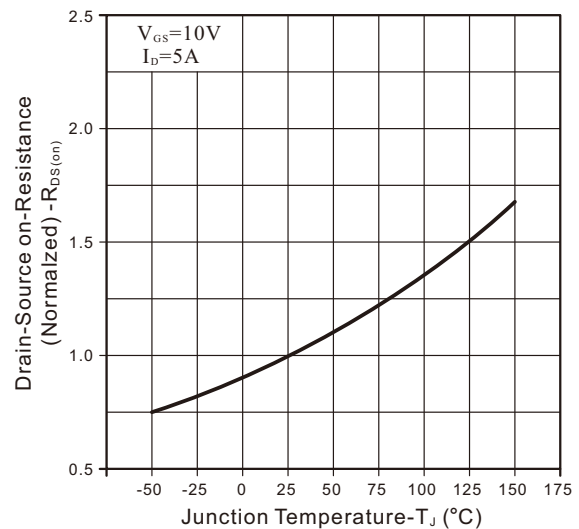


Fig5. Typical Capacitance vs. D-S Voltage

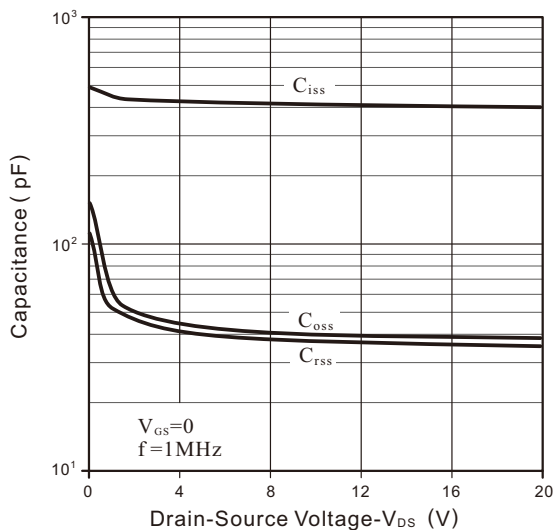
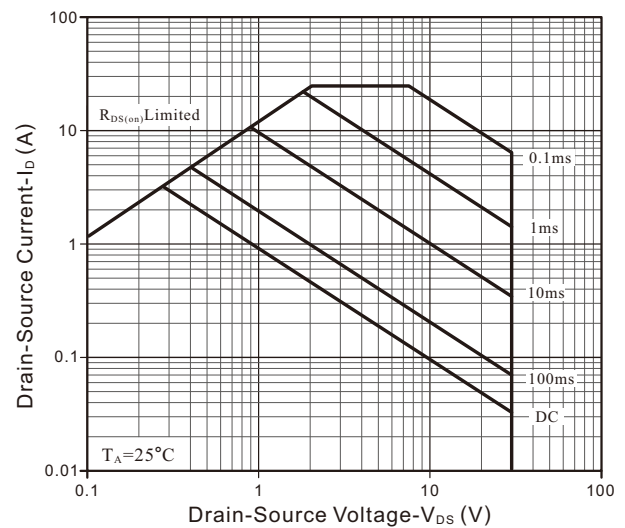
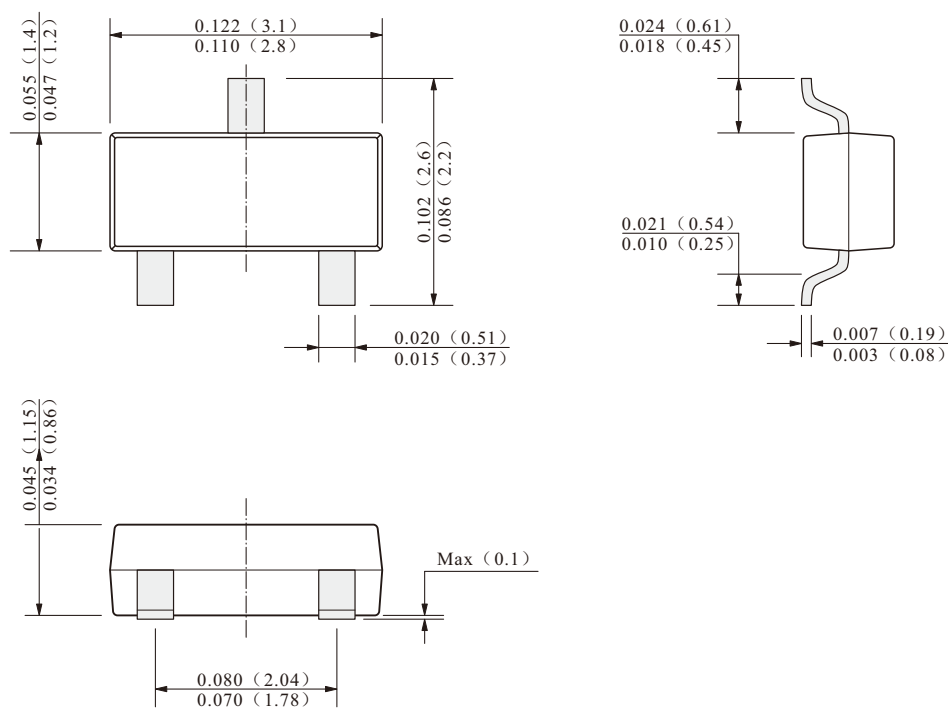


Fig6. Safe Operating Area



## Package Information

### SOT-23-Package Outline Dimension



Dimensions in inches and (millimeters)