

## BC3400R1C

### N-Channel Enhancement Mode MOSFET

The **BC3400R1C** 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

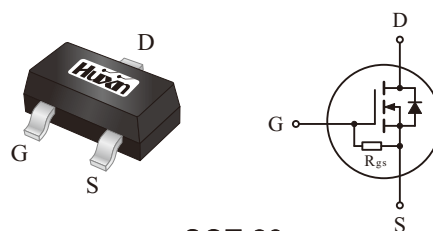
$$V_{DS} = 30V, I_D = 4.5A$$

$$R_{DS(on)} = 24m\Omega (V_{GS} = 10V, Typ)$$

$$R_{DS(on)} = 27m\Omega (V_{GS} = 4.5V, Typ)$$

$$V_{GS(th)} = 0.85V (Typ)$$

#### Package & Pin information



**SOT-23**

#### Package Information

| Product Name | Package | Packing   | Qty.    |
|--------------|---------|-----------|---------|
| BC3400R1C    | 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, $V_{GS}=4.5V$             | $I_D$           | 4.5        | A            |
| Pulsed drain current (Note1)                        | $I_{DM}$        | 16         | A            |
| Single Pulsed Avalanche Energy (Note2)              | $E_{AS}$        | 4.5        | mJ           |
| Power dissipation, $T_C=25^\circ C$                 | $P_D$           | 1000       | mW           |
| Thermal Resistance from Junction to Ambient (Note3) | $R_{\theta JA}$ | 125        | $^\circ C/W$ |
| Operating Junction and Storage Temperature          | $T_J, T_{STG}$  | -55 ~ +150 | $^\circ C$   |

Note:

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

(2) EAS condition:  $T_J=25^\circ C$ ,  $V_{DD}=15V$ ,  $V_G=10V$ ,  $R_G=25\Omega$ ,  $L=0.1mH$

(3) Surface Mounted on FR4 Board.

## 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           | 0.6      | 0.85 | 1.2       | V             | $V_{GS}=V_{DS}, I_D=250\mu\text{A}$                           |
| $R_{DS(on)}$  | Drain-Source on-State resistance | —        | 24   | 32        | m $\Omega$    | $V_{GS}=10\text{V}, I_D=4\text{A}$                            |
|               |                                  | —        | 27   | 36        | m $\Omega$    | $V_{GS}=4.5\text{V}, I_D=4\text{A}$                           |
| $I_{DSS}$     | 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      | $\pm 80$ | —    | $\pm 250$ | $\mu\text{A}$ | $V_{DS}=0, V_{GS}=\pm 12\text{V}$                             |
| $C_{iss}$     | Input capacitance                | —        | 188  | —         | pF            | $V_{GS}=0$<br>$V_{DS}=15\text{V}$<br>$f=1\text{MHz}$          |
| $C_{oss}$     | Output capacitance               | —        | 55   | —         |               |                                                               |
| $C_{rss}$     | Reverse transfer capacitance     | —        | 8.8  | —         |               |                                                               |
| $Q_g$         | Total gate charge                | —        | 1.1  | —         | nC            | $V_{DS}=15\text{V}$<br>$V_{GS}=10\text{V}$<br>$I_D=4\text{A}$ |
| $Q_{gs}$      | Gate to source charge            | —        | 0.4  | —         |               |                                                               |
| $Q_{gd}$      | Gate to drain (Miller) charge    | —        | 0.5  | —         |               |                                                               |
| $R_G$         | Gate resistance                  | —        | 15   | —         | $\Omega$      | $f=1\text{MHz}$ , open drain                                  |
| $R_{GS}$      | Gate-Source pull-down resistor   | —        | 88   | —         | k $\Omega$    |                                                               |

## Body Diode Characteristics

| Symbols  | Parameter                  | Min. | Typ. | Max. | Unit | Test Conditions           |
|----------|----------------------------|------|------|------|------|---------------------------|
| $V_{SD}$ | Diode Forward Voltage      | —    | —    | 1.2  | V    | $V_{GS}=0, I_S=4\text{A}$ |
| $I_{SD}$ | Body Diode Forward Current | —    | —    | 4    | A    |                           |

## Electrical Characteristics Diagrams

Fig1. Typ. output characteristics

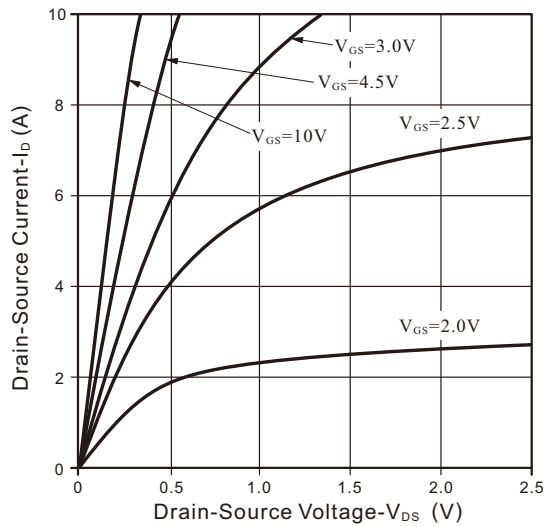


Fig2. Transfer Characteristic

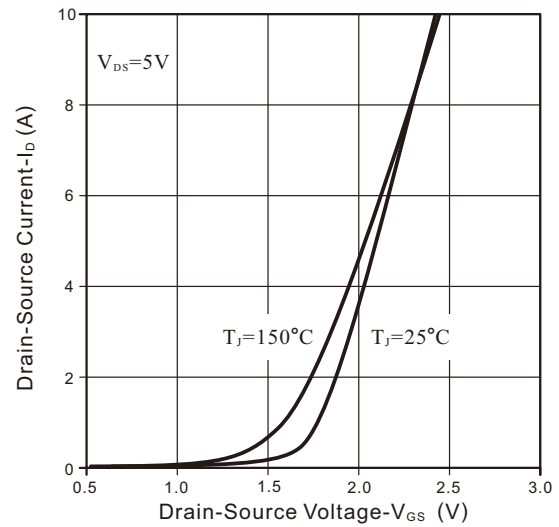


Fig3. On-Resistance vs. Drain Current

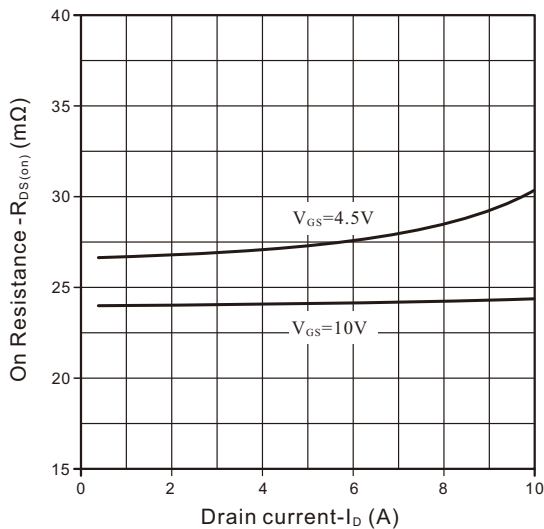


Fig4. On-Resistance vs.  $T_J$

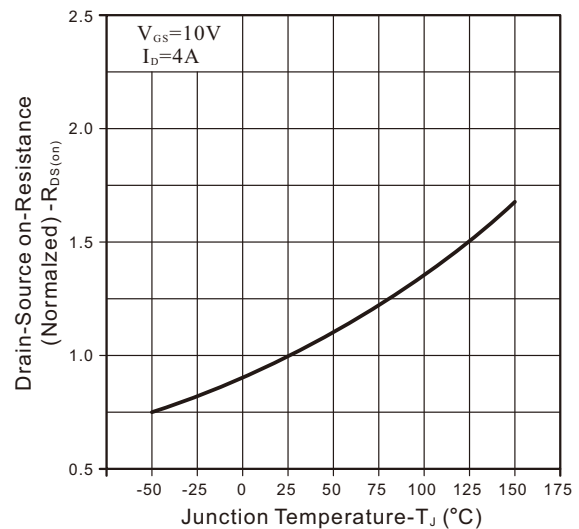


Fig5. Typical Capacitance vs. D-S Voltage

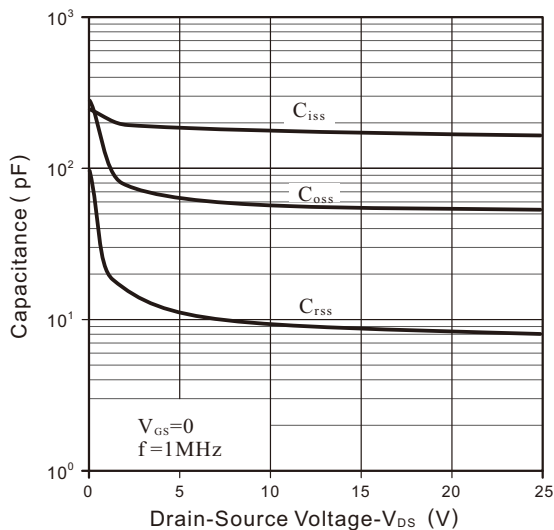
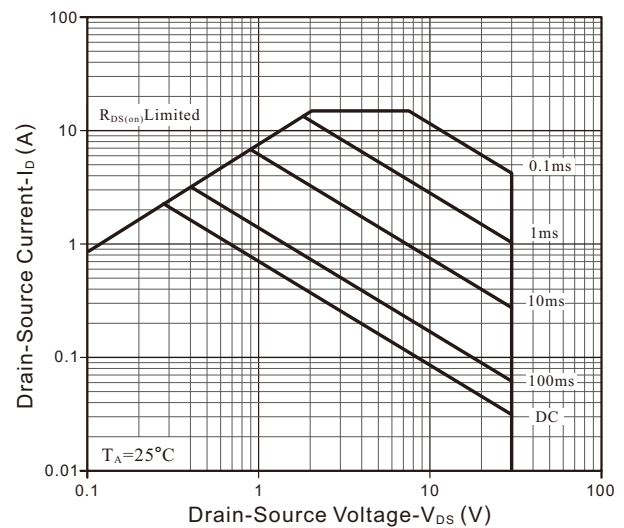
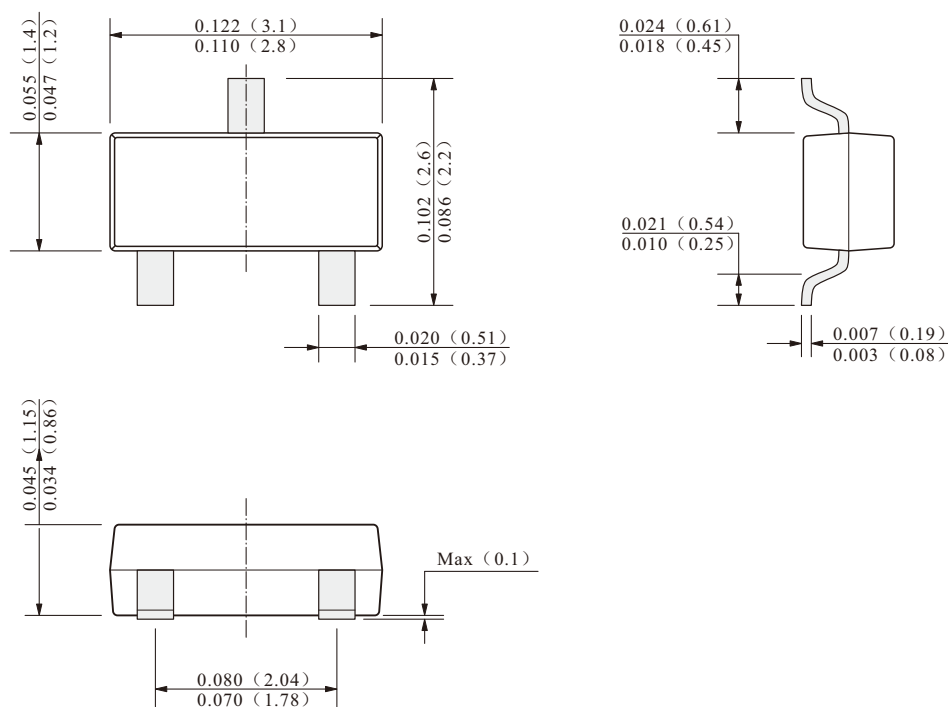


Fig6. Safe Operating Area



## Package Information

### SOT-23-Package Outline Dimension



Dimensions in inches and (millimeters)