## / Revised record

| 版本 | 修订日期 | 有修订的页码 | 修订涉及的内容 | 拟制 | 审核 |
|---|---|---|---|---|---|
| A | 2019-11-30 | ALL | BRD20N03 TO-252 改封装为 BRCS20N03IP TO-251 | 黄超 | 庞隆基 |
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## / Absolute Maximum Ratings(Ta=25 )

| Parameter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DSS}$ | 30 | V |
| Drain Current | | $I_D$(Tc=25℃) | 20 | A |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | V |
| Avalanche Current | | $I_{AS}$ | 10.4 | A |
| Single Pulsed Avalanche Energy | | $E_{AS}$ | 130 | mJ |
| Power Dissipation | | $P_D$(Tc=25℃) | 55 | W |
| Junction Temperature Range | | $T_j$ | 150 | ℃ |
| Storage Temperature Range | | $T_{stg}$ | -55～150 | ℃ |
| Maximum Junction-to-Ambient | Steady-State | $R_{\theta JA}$ | 62.7 | ℃/W |
| Maximum Junction-to-Case | Steady-State | $R_{\theta JC}$ | 2.3 | |

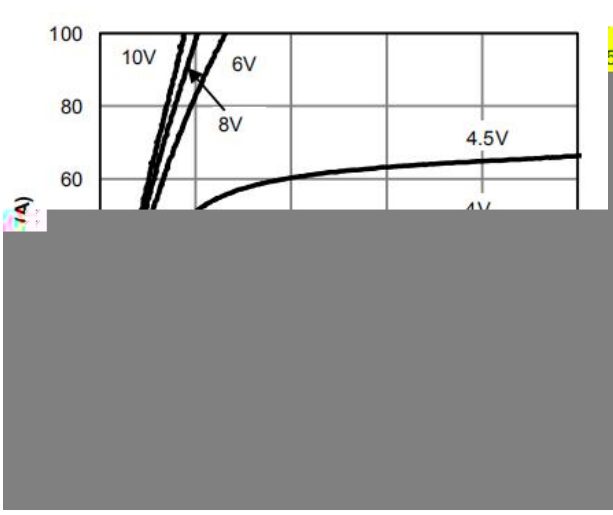
## / Electrical Characteristics(Ta=25 )

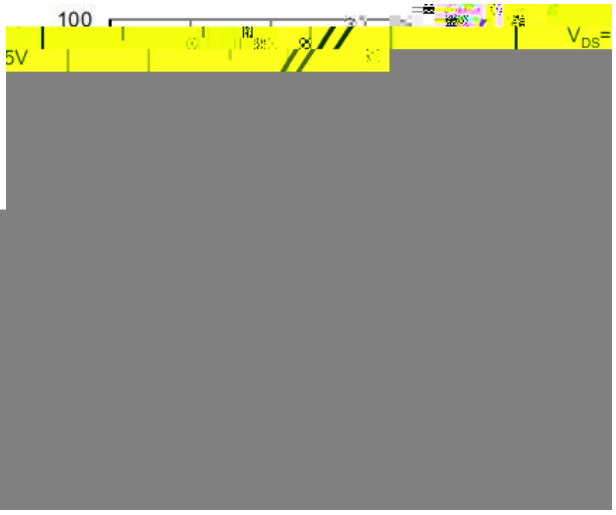
| Parameter | Symbol | Test Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V | $I_D$=250μA | 30 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=30V | $V_{GS}$=0V | | | 1.0 | μA |
| | | $V_{DS}$=30V | $T_J$=150℃ | | | 50 | |
| Gate-Body Leakage Current Forward | $I_{GSS}$ | $V_{GS}$=±20V | $V_{DS}$=0V | | | ±0.1 | μA |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$=10V | $I_D$=20.0A | | 11 | 13 | mΩ |
| | | $V_{GS}$=4.5V | $I_D$=10.0A | | 16 | 18 | mΩ |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$ | $I_D$=250μA | 1 | 1.8 | 3 | V |
| Drain-Source Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V | $I_F$=1.0A | | 0.7 | 1.2 | V |
| Signal Source Resistance | Rg | F=1MHz | | | 1.67 | | Ω |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=25V f=1.0MHz | $V_{GS}$=0V | | 666 | | pF |
| Output Capacitance | $C_{oss}$ | | | | 26 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | | 63 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DS}$=15V $R_L$=0.75Ω | $V_{GS}$=10V $R_{GEN}$=3.0Ω | | 7 | | ns |
| Turn-On Rise Time | $t_r$ | | | | 13.5 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | | 18.5 | | |
| Turn-Off Fall Time | $t_f$ | | | | 4 | | |

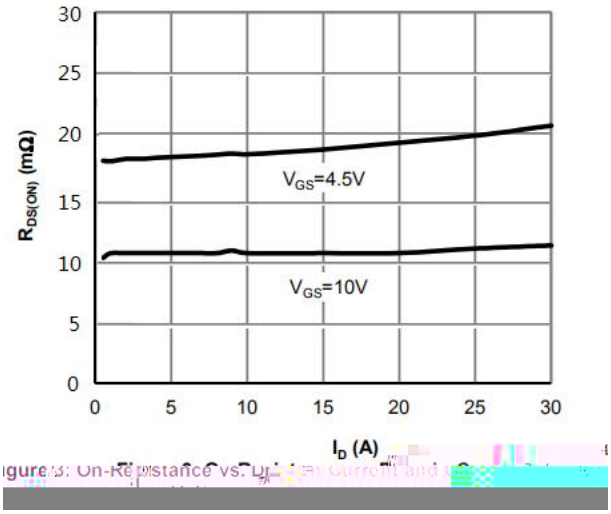
## / Electrical Characteristics(Ta=25 )

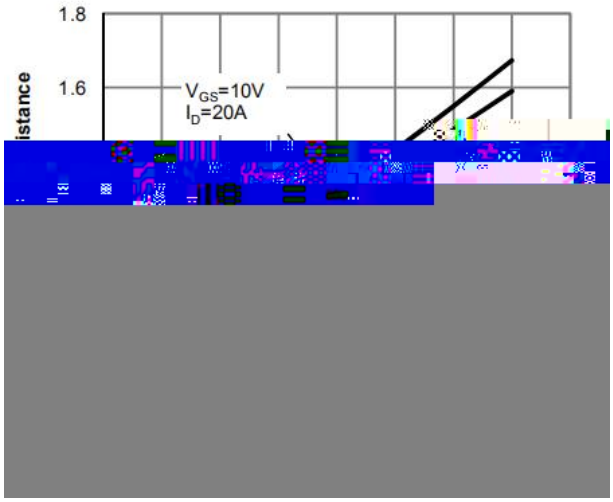
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Total Gate Charge | $Q_{g(10V)}$ | $V_{DS}$=15V $V_{GS}$=10V<br>$I_D$=20.0A | | 14 | | nC |
| Total Gate Charge | $Q_{g(4.5V)}$ | | | 6.5 | | |
| Gate-Source Charge | $Q_{gs}$ | | | 3 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 2.5 | | |

## / Electrical Characteristic Curve



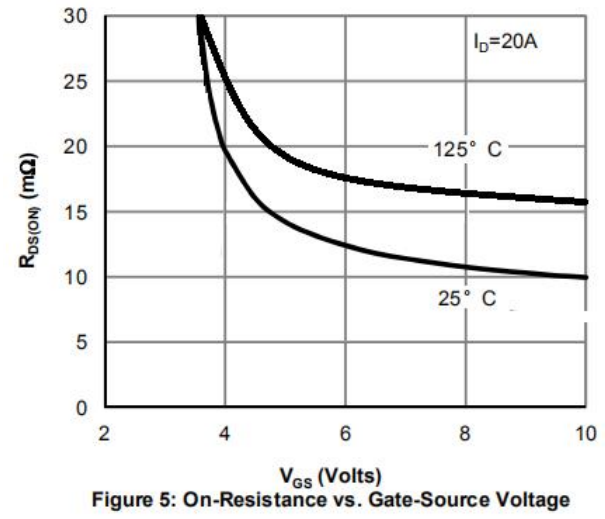
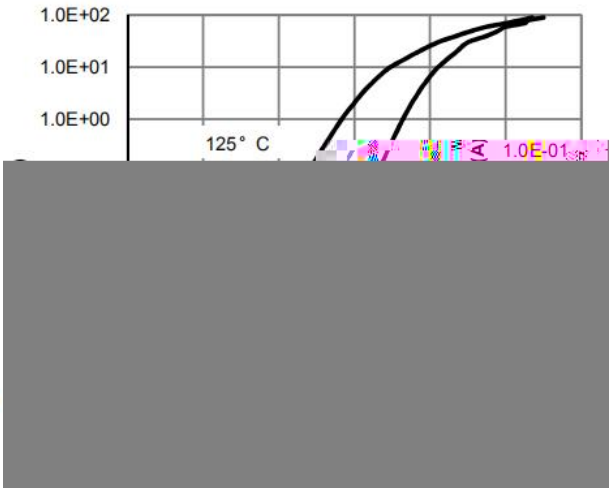
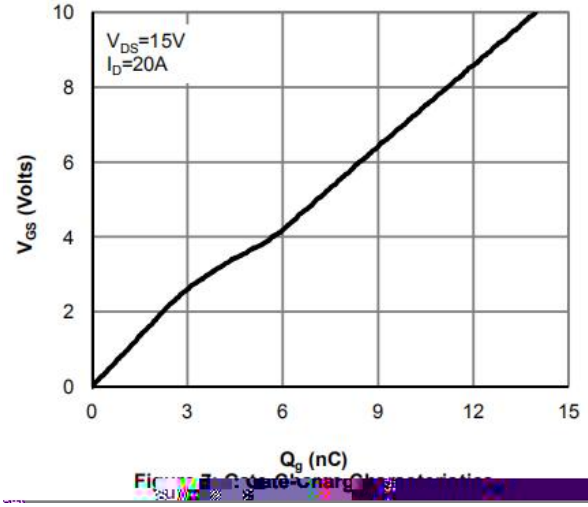
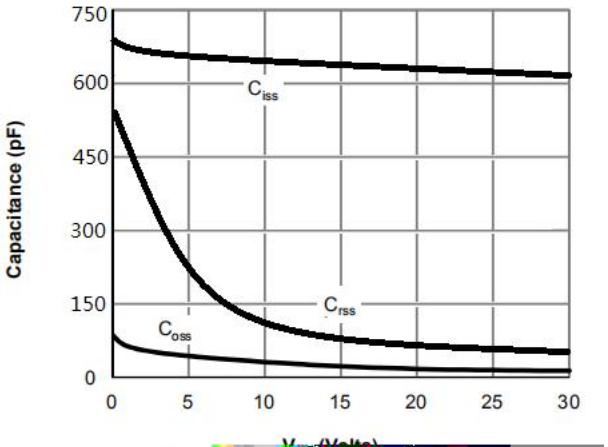



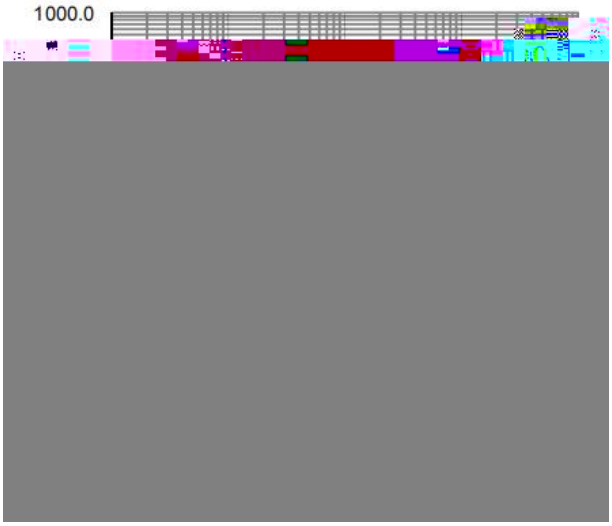

**Figure 5: On-Resistance vs. Gate-Source Voltage**



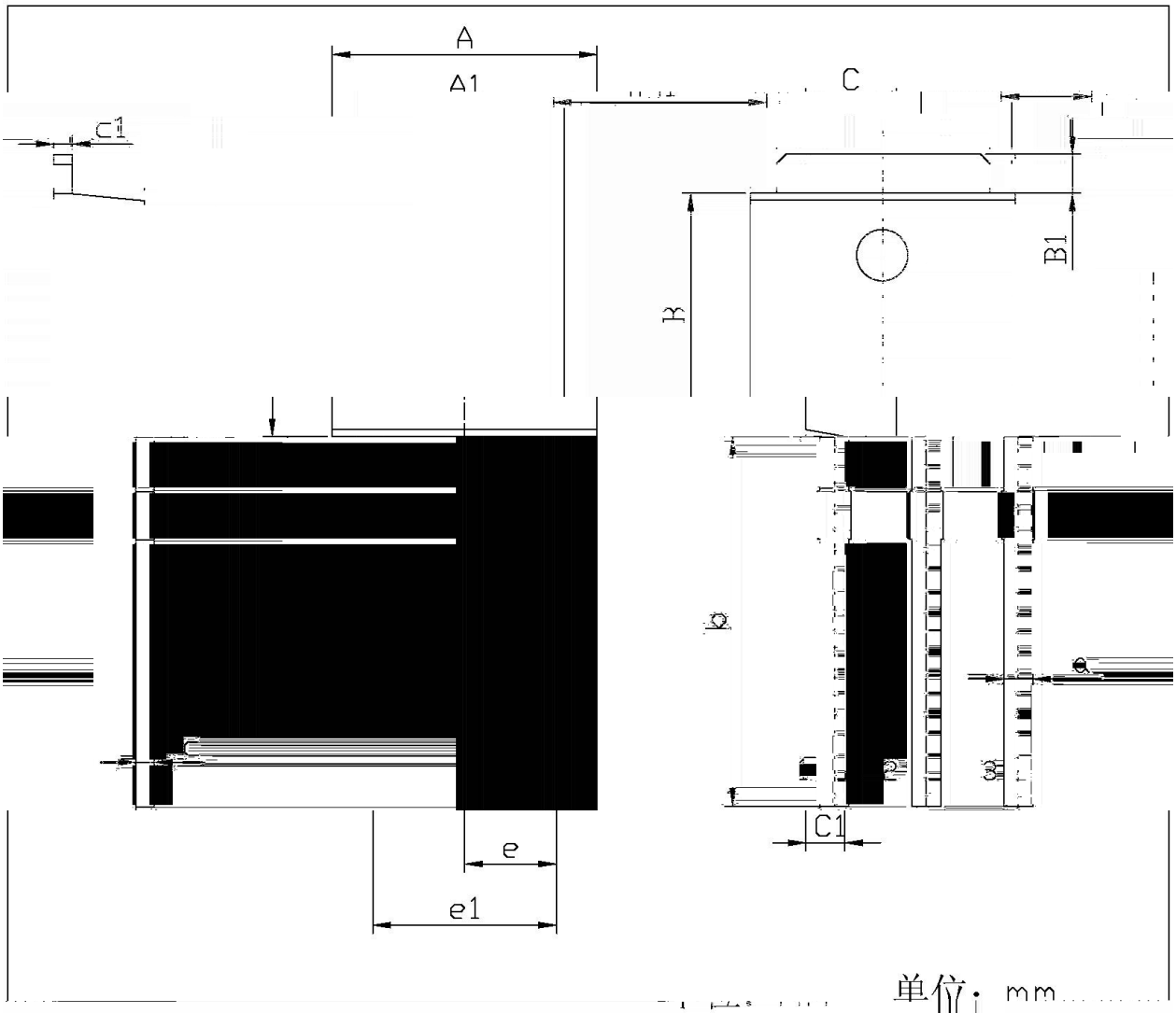
## / Electrical Characteristic Curve



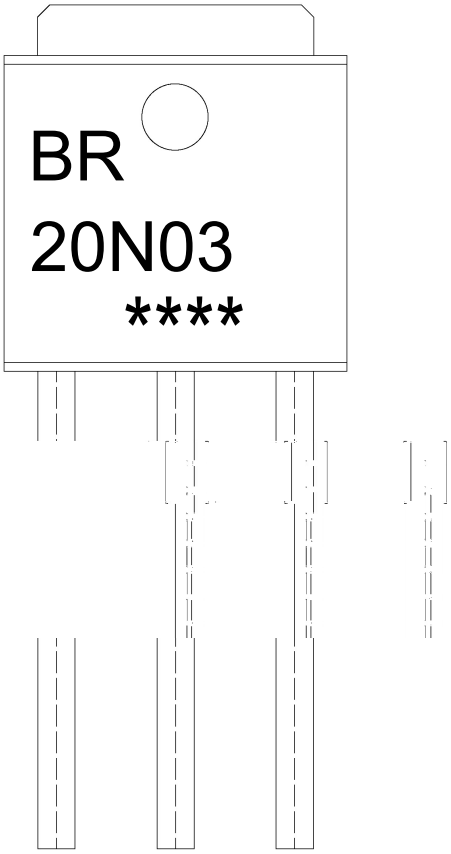



## / Package Dimensions




| Dimensions In Millimeters | | | | Dimensions In Millimeters | | | |
|---|---|---|---|---|---|---|---|
| Symbol | Min | Max | | Symbol | Min | Max | |
| | | 0.70 | | A | 6.45 | 6.75 | |
| | | 9.40 | | A1 | 5.10 | 5.50 | |
| | 5.95 | 6.25 | | c | 0.45 | 0.55 | |
| B1 | 0.95 | 1.25 | | c1 | 0.45 | 0.55 | |
| e | 2.24 | 2.34 | | | | 2.20 | 2.40 |

## / Marking Instructions

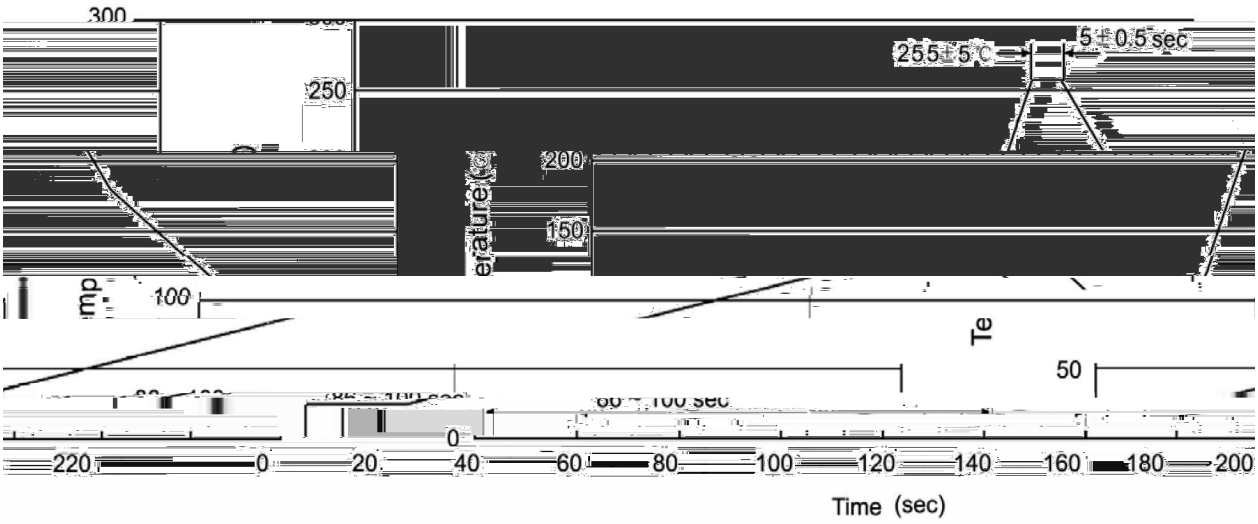



BR

Note:

| | |
|---|---|
| BR: | Company Code |
| 20N03: | Product Type. |
| ****: | Lot No. Code, code change with Lot No. |

## ( ) / Temperature Profile for Dip Soldering(Pb-Free)




| | | | | | | Note: |
|---|---|---|---|---|---|---|
| 1 | 25 | 150 | | 60 | 90sec; | 1.Preheating:25~150 , Time:60~90sec. |
| 2 | 255±5 | | | | 5±0.5sec; | 2.Peak Temp.:255±5 , Duration:5±0.5sec. |
| 3 | | | 2 | 10 | /sec. | 3. Cooling Speed: 2~10 /sec. |

## / Resistance to Soldering Heat Test Conditions

| | | | |
|---|---|---|---|
| 270±5 | 10±1 sec. | Temp.:270±5℃ | Time:10±1 sec |

## / Packaging SPEC.

/ BULK

| Package Type 封装形式 | Units 包装数量 | | | | | Dimension 包装尺寸 (unit: $mm^3$) | | |
|---|---|---|---|---|---|---|---|---|
| | Units/Bag 只/袋 | Bags/Inner Box 袋/盒 | Units/Inner Box 只/盒 | Inner Boxes/Outer Box 盒/箱 | Units/Outer Box 只/箱 | Bag 袋 | Inner Box 盒 | Outer Box 箱 |
| TO-251 | 1,000 | 10 | 10,000 | 5 | 50,000 | 135×190 | 237×172×102 | 560×245×195 |