

# **BRCS022N12SHTL**

Rev.C Apr.-2025

**DATA SHEET**

/ Absolute Maximum Ratings( $T_c=25$  )

| Parameter                                            |              | Symbol          | Rating     | Unit |
|------------------------------------------------------|--------------|-----------------|------------|------|
| Drain-Source Voltage                                 |              | $V_{DS}$        | 120        | V    |
| Drain Current - Continuous                           |              | $I_D$           | 260        | A    |
| Drain Current - Continuous                           |              | $I_D(T_c=100)$  | 185        | A    |
| Drain Current – Pulsed                               |              | $I_{DM}$        | 1040       | A    |
| Gate-Source Voltage                                  |              | $V_{GS}$        | $\pm 20$   | V    |
| Power Dissipation                                    |              | $P_{tot}$       | 300        | W    |
| Continuous-Source Current                            |              | $I_S$           | 260        | A    |
| Single Pulse Avalanche Energy( $V_{DD}=50V, L=1mH$ ) |              | $E_{AS}$        | 2450       | mJ   |
| Junction and Storage Temperature Range               |              | $T_j, T_{stg}$  | -55 to 175 |      |
| Thermal resistance, junction - ambient               | Steady-State | $R_{\theta JA}$ | 45         | / W  |
| Thermal resistance, junction - case                  | Steady-State | $R_{\theta JC}$ | 0.4        |      |

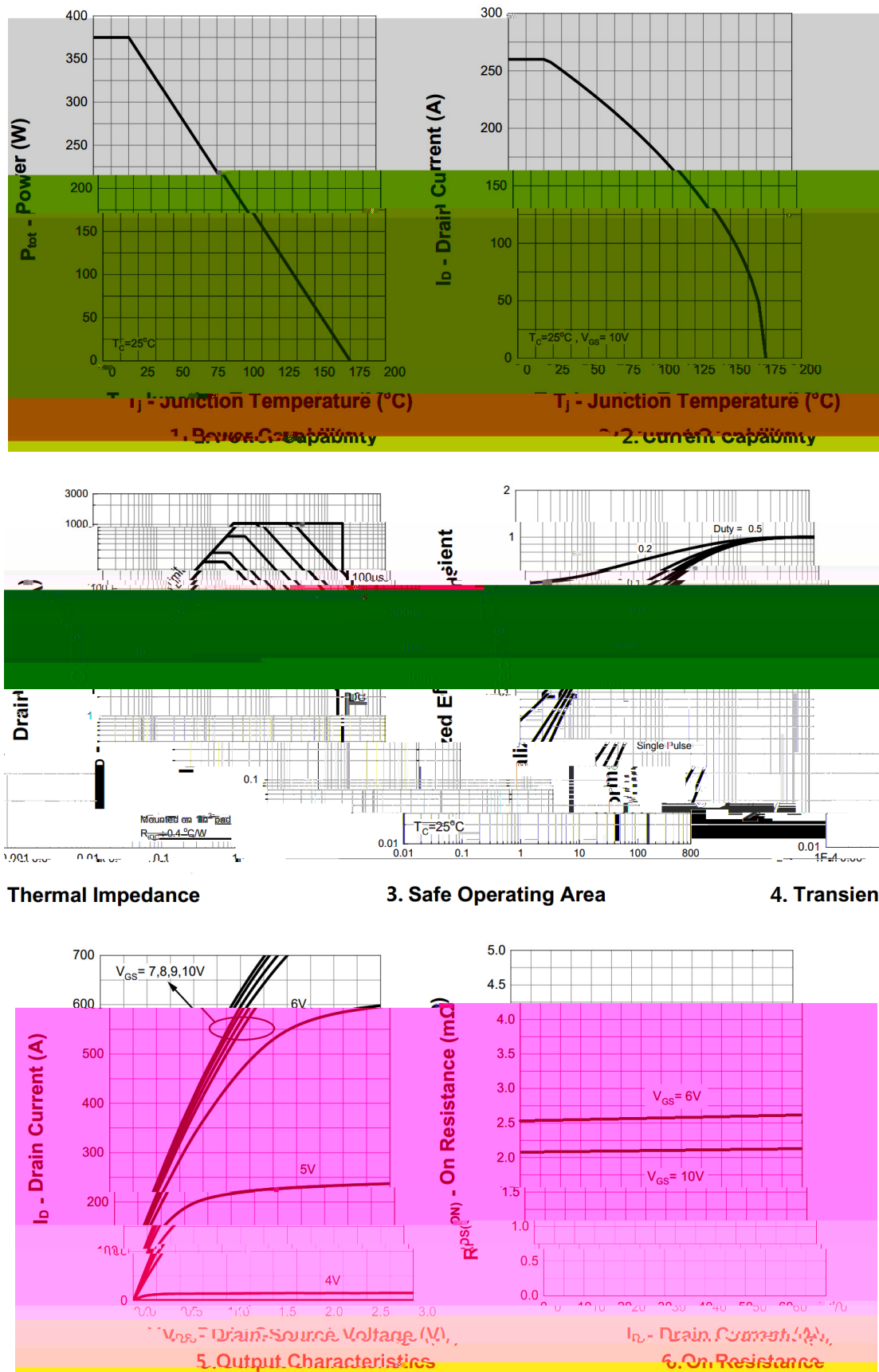
/ Electrical Characteristics( $T_a=25$  )

| Parameter                         | Symbol       | Test Conditions                      | Min | Typ   | Max       | Unit      |
|-----------------------------------|--------------|--------------------------------------|-----|-------|-----------|-----------|
| Drain-Source Breakdown Voltage    | $BV_{DSS}$   | $I_D=250\mu A, V_{GS}=0V$            | 120 |       |           | V         |
| Zero Gate Voltage Drain Current   | $I_{DSS}$    | $V_{DS}=96V, V_{GS}=0V$              |     |       | 1         | $\mu A$   |
| Gate-Body leakage current         | $I_{GSS}$    | $V_{DS}=0V, V_{GS}=\pm 20V$          |     |       | $\pm 100$ | nA        |
| Gate Threshold Voltage            | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$        | 2.0 |       | 4.0       | V         |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}=10V, I_D=50A$                |     | 1.6   | 2.2       | $m\Omega$ |
|                                   | $R_{DS(ON)}$ | $V_{GS}=6V, I_D=30A$                 |     | 2.3   | 2.8       | $m\Omega$ |
| Diode Forward Voltage             | $V_{SD}$     | $I_S=50A, V_{GS}=0V$                 |     |       | 1.3       | V         |
| Input Capacitance                 | $C_{iss}$    | $V_{DS}=60V, V_{GS}=0V, f=1.0MHz$    |     | 11834 |           | pF        |
| Output Capacitance                | $C_{oss}$    |                                      |     | 1350  |           |           |
| Reverse Transfer Capacitance      | $C_{rss}$    |                                      |     | 78    |           |           |
| Total Gate Charge                 | $Q_g$        | $V_{GS}=10V, I_{DS}=50A, V_{DS}=60V$ |     | 213   |           | nC        |
| Gate Source Charge                | $Q_{gs}$     |                                      |     | 62    |           |           |
| Gate Drain Charge                 | $Q_{gd}$     |                                      |     | 54    |           |           |

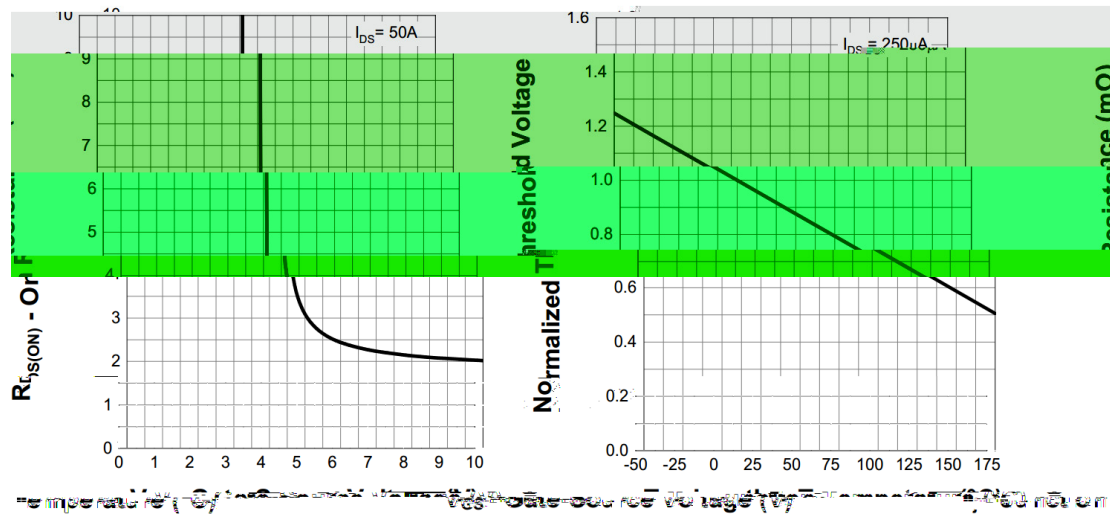
## / Electrical Characteristics(Ta=25 )

| Parameter               | Symbol       | Test Conditions                                                              | Min | Typ | Max | Unit |
|-------------------------|--------------|------------------------------------------------------------------------------|-----|-----|-----|------|
| Turn-On Delay Time      | $t_{d(on)}$  | $V_{GS}=10V$ $V_{DS}=60V$<br>$R_L=1.2\Omega$ $R_G=3.9\Omega$<br>$I_{DS}=50A$ |     | 30  |     | ns   |
| Turn-On Rise Time       | $t_r$        |                                                                              |     | 102 |     |      |
| Turn-Off Delay Time     | $t_{d(off)}$ |                                                                              |     | 143 |     |      |
| Turn-Off Fall Time      | $t_f$        |                                                                              |     | 101 |     |      |
| Reverse Recovery Time   | $t_{rr}$     | $I_{DS} = 50 A, V_{GS} = 0 V$<br>$dI_{SD}/dt = 100 A/\mu s$                  |     | 137 |     | nS   |
| Reverse Recovery Charge | $Q_{rr}$     |                                                                              |     | 474 |     | nC   |

## / Electrical Characteristic Curve



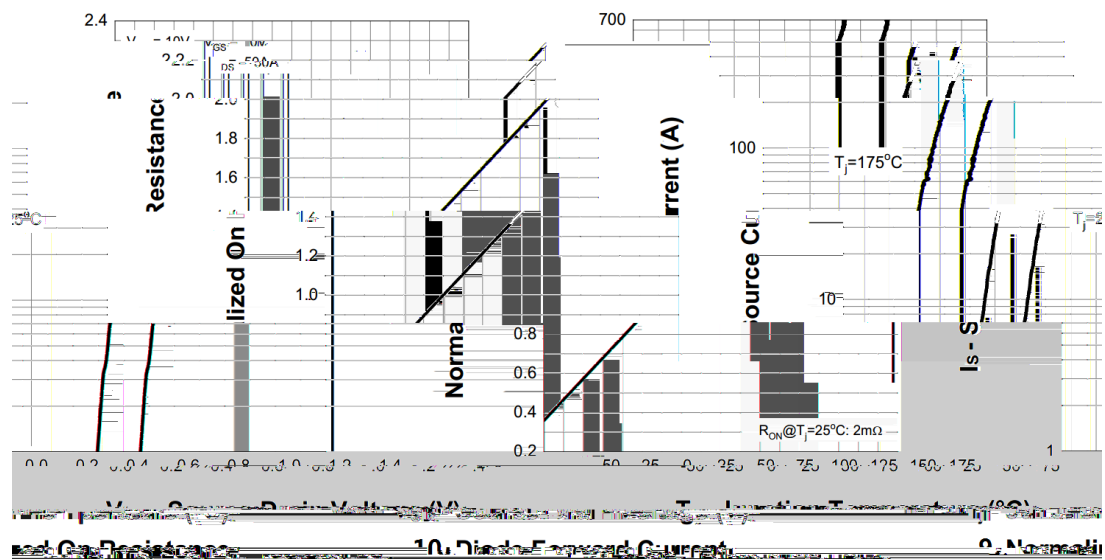
## / Electrical Characteristic Curve



Threshold Voltage

7. Transfer Characteristics

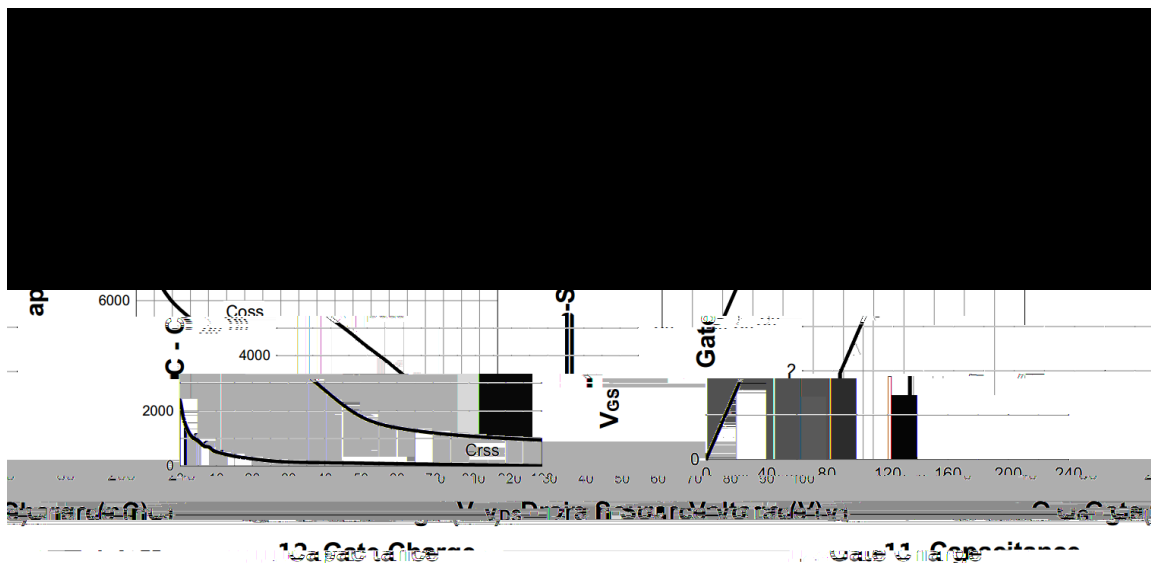
8. Normalized



Resistance

10. Normalized Forward Current

11. Normalized

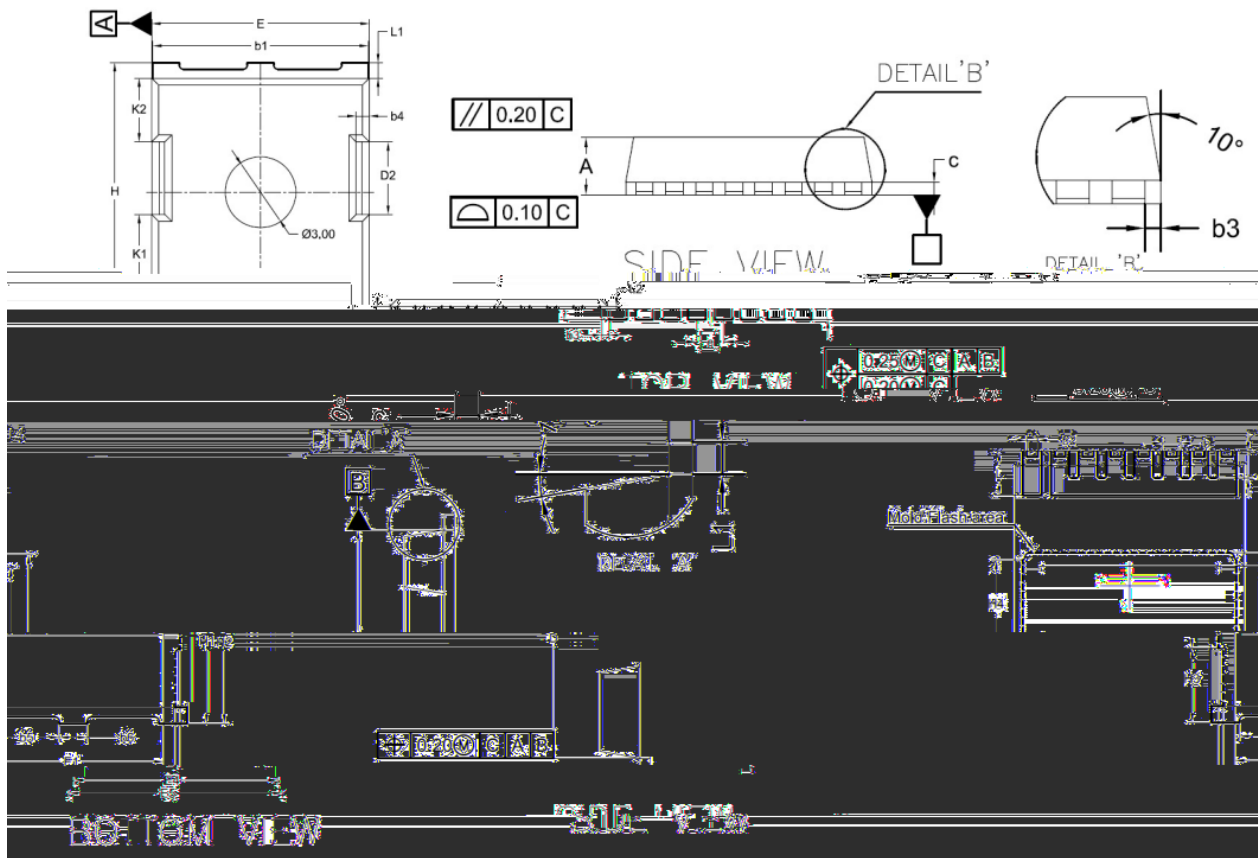


Coss

12. Gate Charge

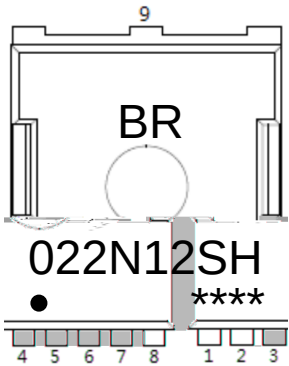
13. Gate Charge

## / Package Dimensions



| Symbol | Dimensions In Millimeters |        |        | Symbol | Dimensions In Millimeters |       |       |
|--------|---------------------------|--------|--------|--------|---------------------------|-------|-------|
|        | MIN.                      | NOM.   | MAX.   |        | MIN.                      | NOM.  | MAX.  |
| A      | 2.200                     | 2.300  | 2.400  | b1     | 9.700                     | 9.800 | 9.900 |
| c      | 0.492                     | 0.500  | 0.508  | b1     | 0.420                     | 0.460 | 0.500 |
| D      | 10.280                    | 10.380 | 10.480 | b3     | 0.350                     |       |       |
| E      | 9.800                     | 9.900  | 10.000 | b4     | 0.600                     |       |       |
| e      | 1.20 BSC                  |        |        | b5     | 3.100                     |       |       |
| H      | 11.580                    | 11.680 | 11.780 | b6     | 1.200                     |       |       |
| H1     | 6.650                     | 6.750  | 6.850  | L      | 1.700                     | 1.900 | 2.100 |
| H2     | 7.300                     |        |        | L1     | 0.700                     |       |       |
| H3     | 3.200                     |        |        | L2     | 0.600                     |       |       |
| H4     | 3.800                     |        |        | L4     | 1.050                     | 1.150 | 1.250 |
| K1     | 4.180                     |        |        | L5     | 0.500                     | 0.600 | 0.700 |
| K2     | 2.900                     |        |        | E1     | 7.800                     |       |       |
| D2     | 3.300                     |        |        | E4     | 8.800                     |       |       |
| b      | 0.700                     | 0.800  | 0.900  | E5     | 9.200                     |       |       |

/ Marking Instructions



|          |                                       |
|----------|---------------------------------------|
| BR       |                                       |
| 022N12SH |                                       |
| ****     |                                       |
| Note     |                                       |
| BR       | Company Code                          |
| 022N12SH | Product Type Code                     |
| ****:    | Lot No. Code, code change with Lot No |

