## Ã a ? d / Absolute Maximum Ratings(Ta=25 ; )

| @ ƒ Parameter | | … Z Symbol | ƒ › Rating | % y Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | -40 | V |
| Drain Current - Continuous | | $I_D$($T_c$=25 ) | -41 | A |
| Drain Current – Pulsed | | $I_{DM}$ | -72 | A |
| Gate-Source Voltage | | $V_{GS}$ | f 20 | V |
| Power Dissipation | | $P_D$($T_c$=25 ) | 30 | W |
| Single Pulse Avalanche Energy(L=0.5mH) | | $E_{AS}$ | 317.5 | mJ |
| Avalanche Current(L=0.5mH) | | $I_{AS}$ | -31.5 | A |
| Junction and Storage Temperature Range | | $T_j$, $T_{stg}$ | -55 to 150 | - |
| Thermal resistance, junction - ambient | t 0 10s | R ©JA | 22 | / W |
| | Steady-State | | 55 | |
| Thermal resistance, junction - case | Steady-State | R ©JC | 4.2 | |

## Ô4ì × ? d / Electrical Characteristics(Ta=25 ; )

| @ ƒ Parameter | … Z Symbol | y ¡ Ú ^ Test Conditions | Â 4 › Min | Á º › Typ | Â Ý › Max | % y Unit |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $I_D$=-250 A $V_{GS}$=0V | -40 | -48 | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=-40V $V_{GS}$=0V | | | -1 | uA |
| Gate-Body leakage current | $I_{GSS}$ | $V_{DS}$=0V, $V_{GS}$= ±20V | | | f 100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=VGS $I_D$=-250 A | -1 | -1.7 | -2.5 | V |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}$=-10V, $I_D$=-20A | | 11.6 | 13.5 | m S |
| | | $V_{GS}$=-4.5V, $I_D$=-10A | | 15 | 25 | |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=-1A, $V_{GS}$=0V | | | -1.2 | V |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=-25V $V_{GS}$=0V f=1.0MHz | | 4760 | | pF |
| Output Capacitance | $C_{oss}$ | | | 2800 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 1960 | | |
| Gate resistance | $R_g$ | $V_{GS}$=0V $V_{DS}$=0V f=1MHz | | 17.5 | | |
| Total Gate Charge | $Q_{g(10V)}$ | $V_{GS}$=-10V, $V_{DS}$=-20V, $I_D$=-20A | | 34 | | nC |
| Total Gate Charge | $Q_{g(4.5V)}$ | | | 17.5 | | |
| Gate Source Charge | $Q_{gs}$ | | | 5.8 | | |
| Gate Drain Charge | $Q_{gd}$ | | | 9 | | |

## Ô4ì × ? d / Electrical Characteristics(Ta=25 ; )

| @ ƒ<br>Parameter | … Z<br>Symbol | y ¡ Ú ^<br>Test Conditions | Â 4 ›<br>Min | Á º ›<br>Typ | Â Ý ›<br>Max | % y<br>Unit |
|---|---|---|---|---|---|---|
| Turn-On Delay Time | $t_{d(on)}$ | $V_{GS}$=-10V $V_{DS}$=-20V<br>$R_L$=0.75 ¡ $R_{GEN}$=3 ¡ | | 11 | | ns |
| Turn-On Rise Time | $t_r$ | | | 7.8 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 44 | | |
| Turn-Off Fall Time | $t_f$ | | | 18 | | |

BRCS120P04YBQ

## Ô ? d • Ž ¢ Electrical Characteristic Curve

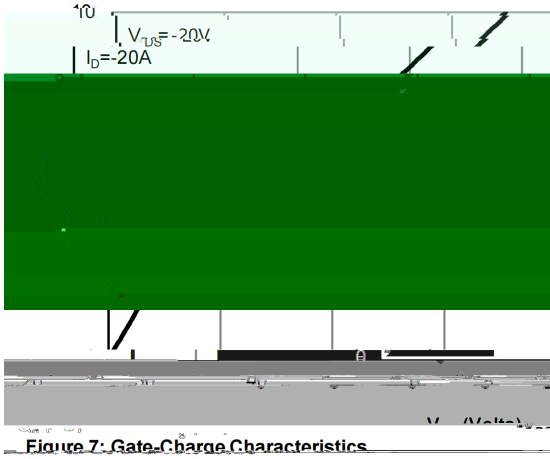



Figure 7: Gate-Charge Characteristics

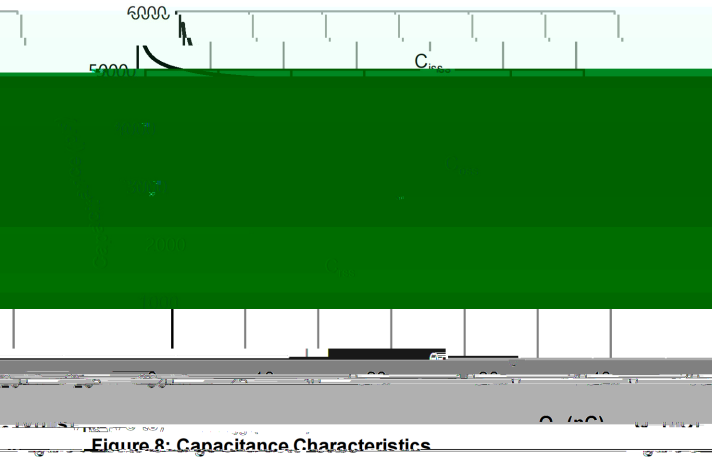
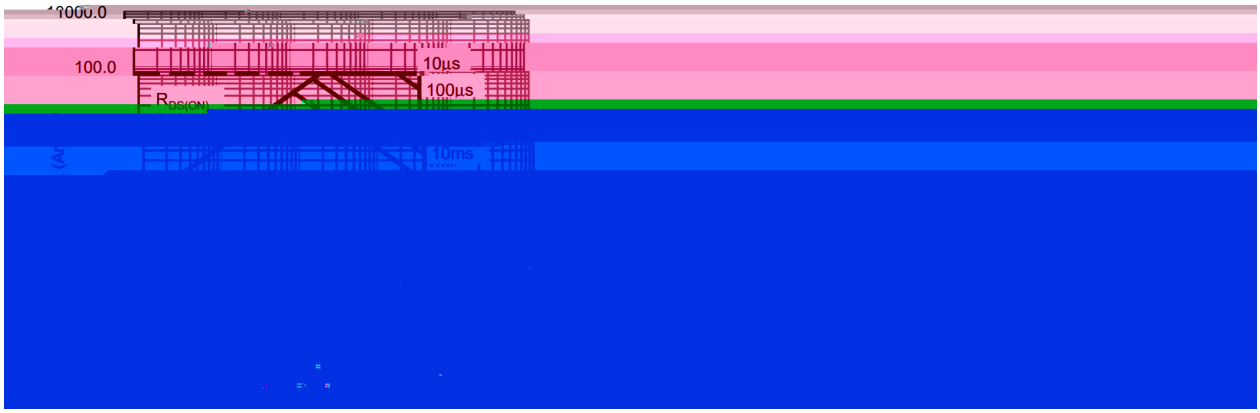
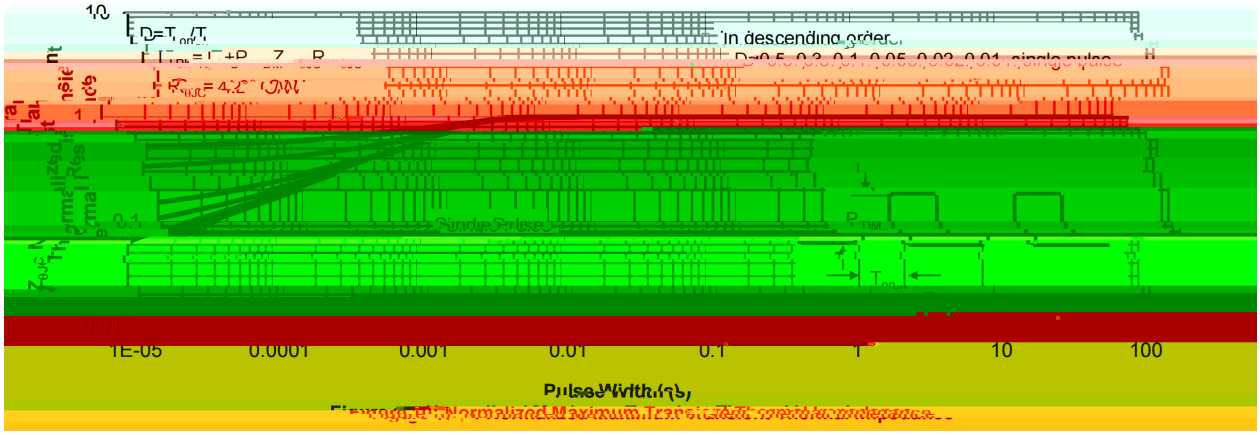


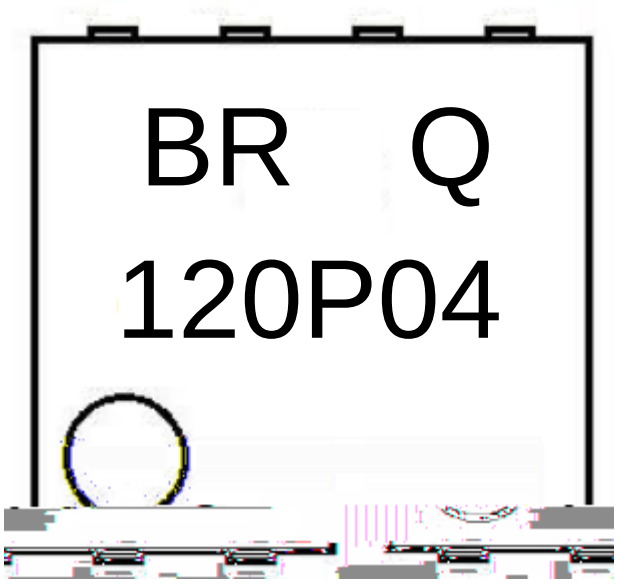

Figure 8: Capacitance Characteristics



BRCS120P04YBQ

## , M y ƒ / Marking Instructions




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Note:

| | |
|---|---|
| BR: | Company Code |
| Q: | Automobile halogen-free product Code |
| 120P04: | Product Type Code |
| ****: | Lot No. Code, code change with Lot No |

š WD t … • Ž ¢ ( x / ) / :K S V K X G Z [ X K 6 X U L O R K L U X /8 8 K L R U ] 9 U R J K X O T M 6