# BRCS020N04RA
Rev.C Mar.-2023

蓝箭电子
BLUE ROCKET ELECTRONICS
DATA SHEET

## / Descriptions

TO-220 N

N-CHANNEL MOSFET in a TO-220 Plastic Package.

## / Features

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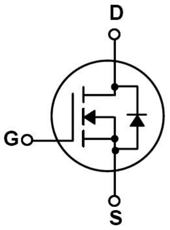
Ultra Low On-Resistance,fast switching, HF Product.

## / Applications

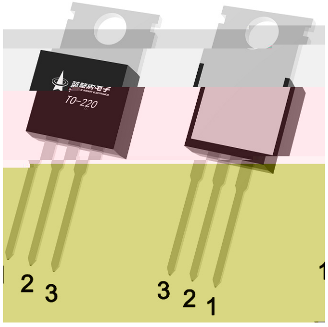
PFC

These devices are well suited for high efficient switched mode power supplies Active power factor correction, electronic lamp ballast based on half bridge topology.

## / Equivalent Circuit



## / Pinning



PIN1 G PIN 2 4 D PIN 3 S

## / Marking

See Marking Instructions.

## / Absolute Maximum Ratings(Ta=25 )

| Parameter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DSS}$ | 40 | V |
| Drain Current | | $I_D$(Tc=25 ) | 220 | A |
| Pulsed Drain Current | | $I_{DM}$ | 800 | A |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | V |
| Single Pulsed Avalanche Energy L=0.5mH | | $E_{AS}$ | 482 | mJ |
| Avalanche Current | | $I_{AS}$ | 35 | A |
| Total Power Dissipation | | $P_D$(Tc=25 ) | 187 | W |
| Junction and Storage Temperature Range | | $T_J$,$T_{STG}$ | -55 to 150 | |
| Thermal Resistance-Junction to Ambient | t ≤ 10s | $R_{\theta JA}$ | 15 | /W |
| | Steady-State | | 60 | |
| Thermal Resistance-Junction to Case | Steady-State | $R_{\theta JC}$ | 0.67 | |

## / Electrical Characteristics(Ta=25 )

| Parameter | Symbol | Test Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V | $I_D$=250μA | 40 | 44 | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=40V | $V_{GS}$=0V | | | 1 | μA |
| Gate-Body Leakage Current Forward | $I_{GSS}$ | $V_{GS}$=±20V | $V_{DS}$=0V | | | ±100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$ | $I_D$=250μA | 1 | 1.6 | 3 | V |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$=10V | $I_D$=20A | | 1.6 | 2 | mΩ |
| | | $V_{GS}$=4.5V | $I_D$=10A | | 2.1 | 4 | |
| Forward On Voltage | $V_{SD}$ | $V_{GS}$=0V | $I_S$=1A | | | 1.2 | V |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=25V<br>f=1MHz | $V_{GS}$=0V | | 11000 | | pF |
| Output Capacitance | $C_{oss}$ | | | | 840 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | | 650 | | |

T72e52.26 35492485.852-18.06 refoQ.777 .852 Q(T72e57.66 354924)74.66-18.06 refoBT/T84 1 Tf10.4958 0 0 1

## / Electrical Characteristic Curve

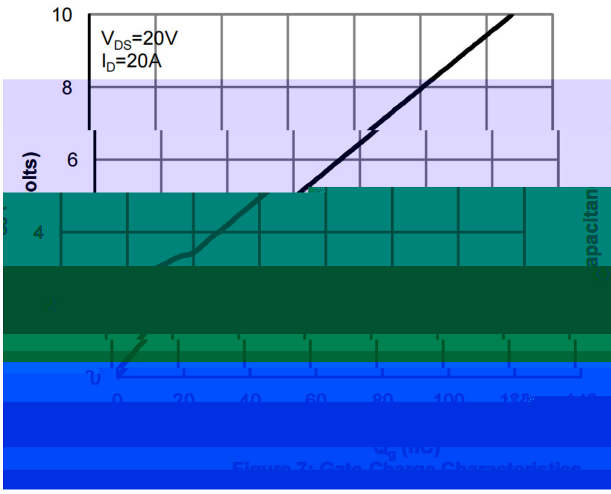


Figure 7: Gate Charge Characteristics

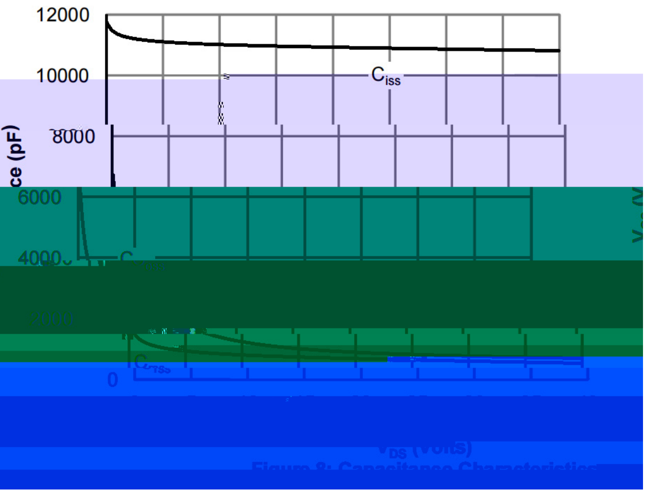
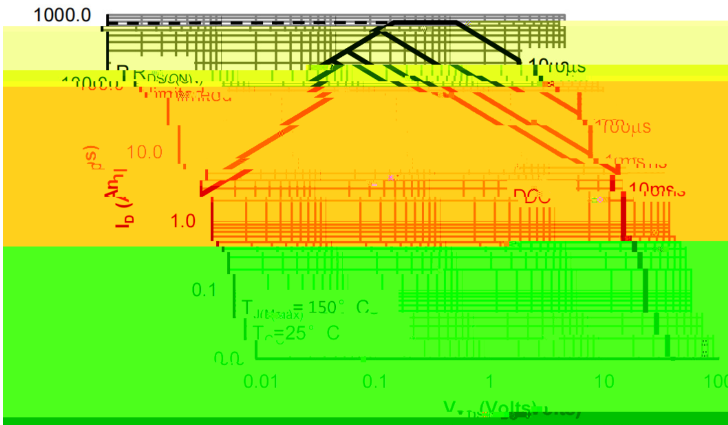
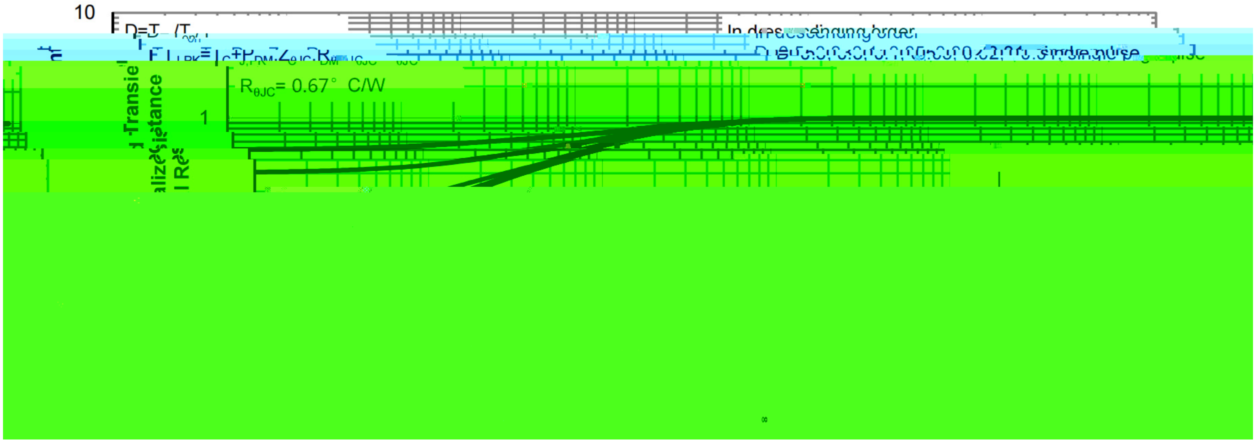


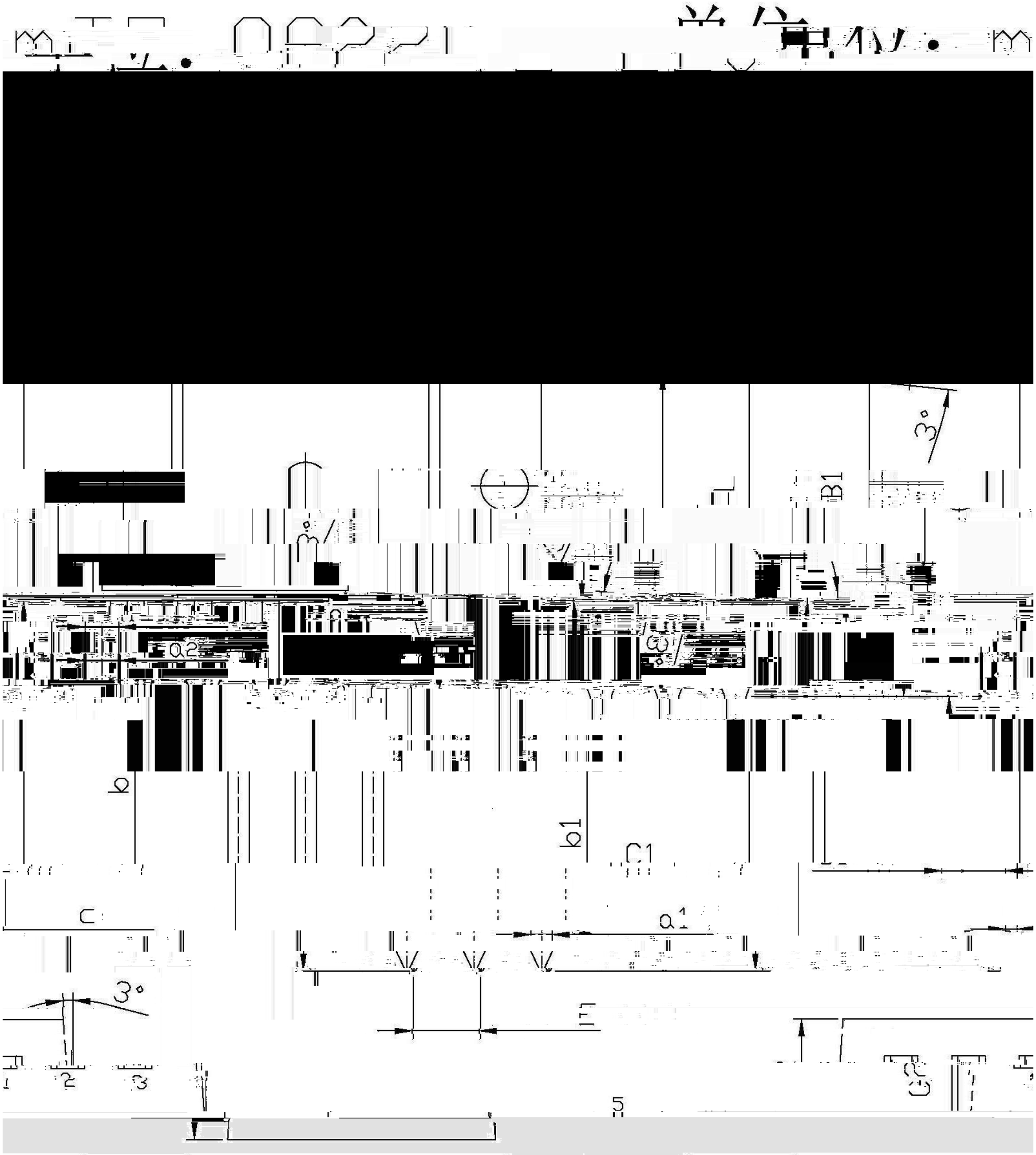
Figure 8: Capacitance Characteristics



$V_{GS}$ > or equal to 4.5V

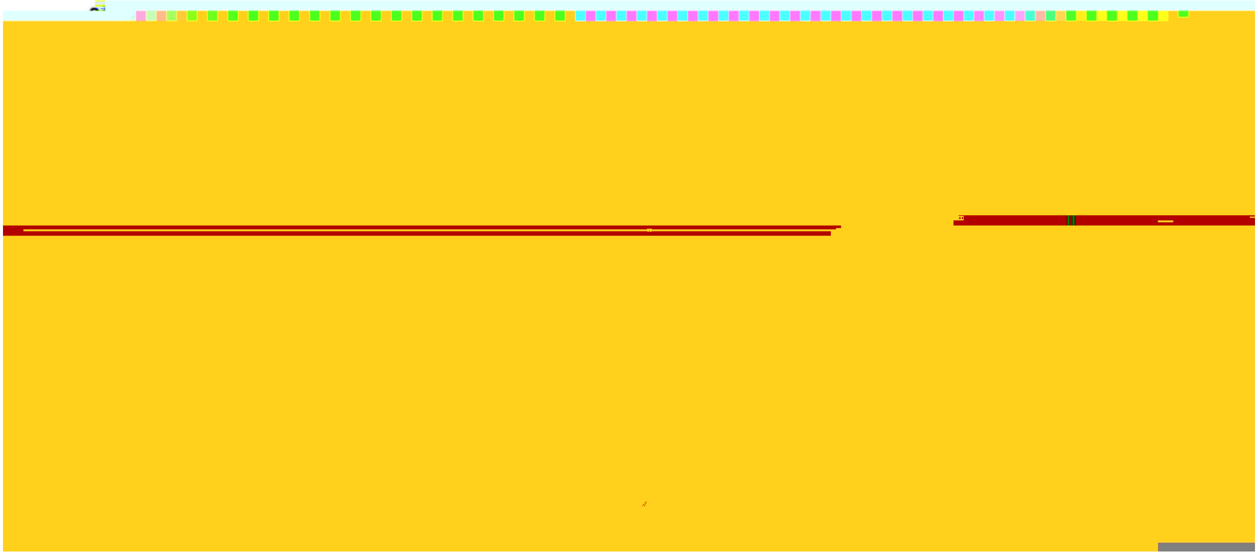


## / Package Dimensions



| Symbol | Dimensions In Millimeters Min | Dimensions In Millimeters Max | Symbol | Dimensions In Millimeters Min | Dimensions In Millimeters Max |
|---|---|---|---|---|---|
| A | 9.8 | 10.2 | C | 1.2 | 1.4 |
| R | 3.56 | 3.64 | B | 6.3 | 6.7 |
| [illegible] | 15.7 | 16.1 | B1 | 9.0 | 9.4 |
| b | 12.6 | 13.6 | C1 | 2.2 | 2.6 |

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



1 25 150 60 90sec;
2 255±5 5±0.5sec;
3 2 10 /sec.

Note:
1.Preheating:25~150 , Time:60~90sec.
2.Peak Temp.:255±5 , Duration:5±0.5sec.
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 | Units | | | | | Dimension (unit mm$^3$) | | |
|---|---|---|---|---|---|---|---|---|
| | Units/Bag / | Bags/Inner Box / | Units/Inner Box / | Inner Boxes/Outer Box / | Units/Outer Box / | Bag | Inner Box | Outer Box |
| TO-220/F | 200 | 10 | 2,000 | 5 | 10,000 | 135×190 | 237×172×102 | 560×245×195 |

/ TUBE

Units/Inner Box ¾
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