

BRCS020N04RA

Rev.C Mar.-2023

/ Descriptions

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

/ Features

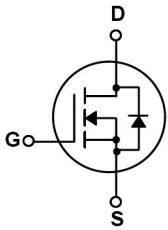
Ultra Low On-Resistance, fast switching, HF Product.

/ Applications

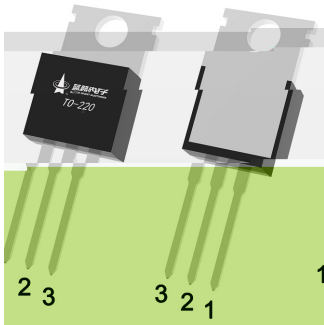
PFC

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 | $I_D(T_C=25)$ | 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 | $P_D(T_C=25)$ | 187 | W | |
| Junction and Storage Temperature Range | T_J, T_{STG} | -55 to 150 | | |
| Thermal Resistance-Junction to Ambient | t 10s | R_{JA} | 15 | /W |
| | Steady-State | | 60 | |
| Thermal Resistance-Junction to Case | Steady-State | R_{JC} | 0.67 | |

/ Electrical Characteristics(Ta=25)

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

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DATA SHEET

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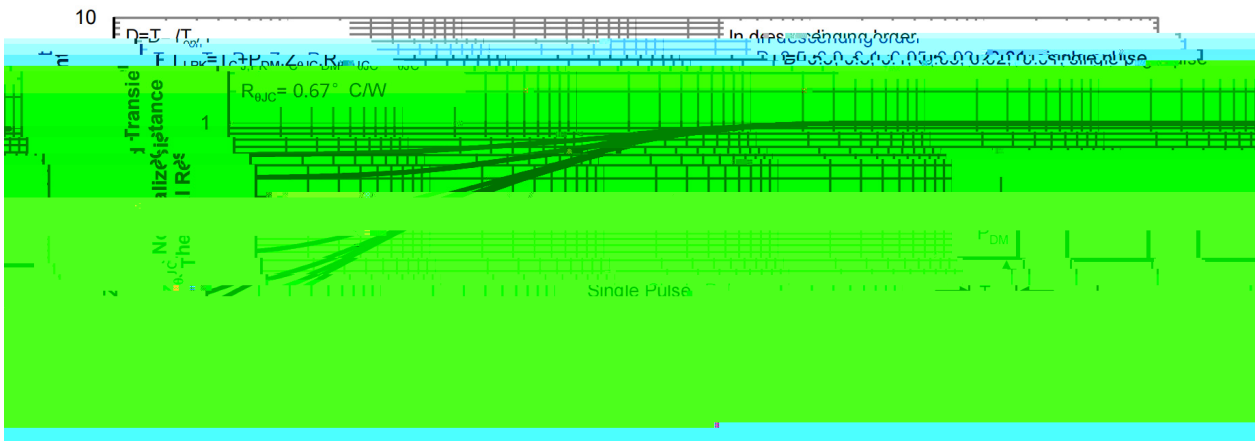
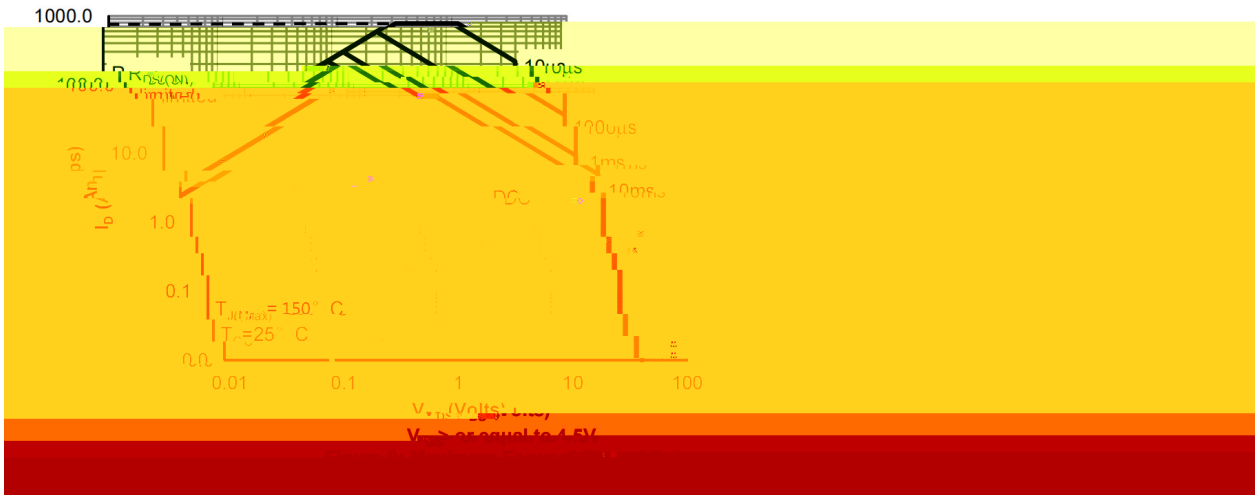
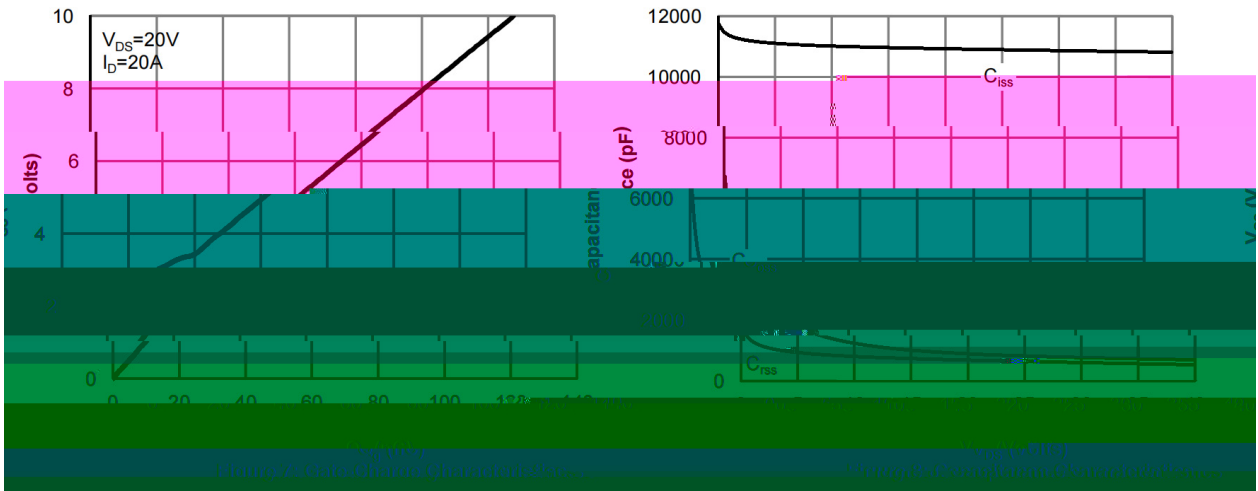
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T72e52.26 35492485.852-18.06 refoQ.777 .852 Q(T72e57.66 354924)74.66-18.06 refoBT/T84 1 Tf10.4958 0 0 10

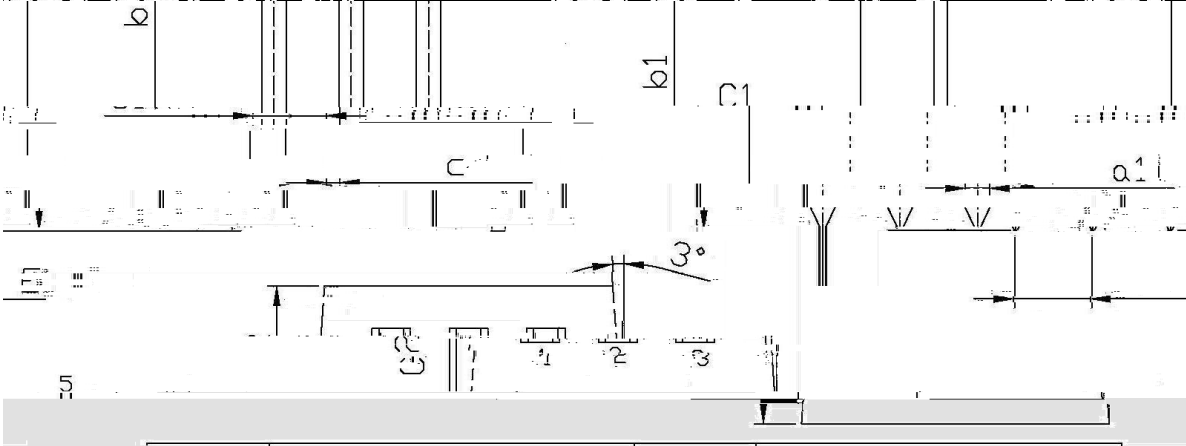
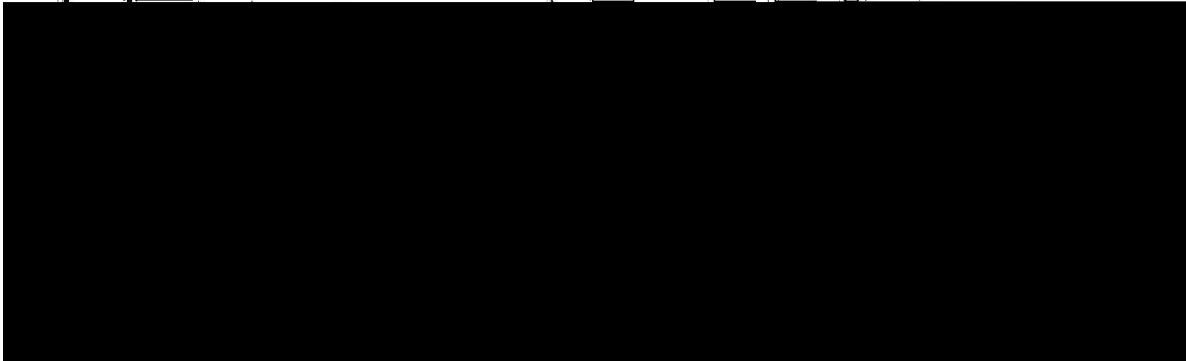


DATA SHEET

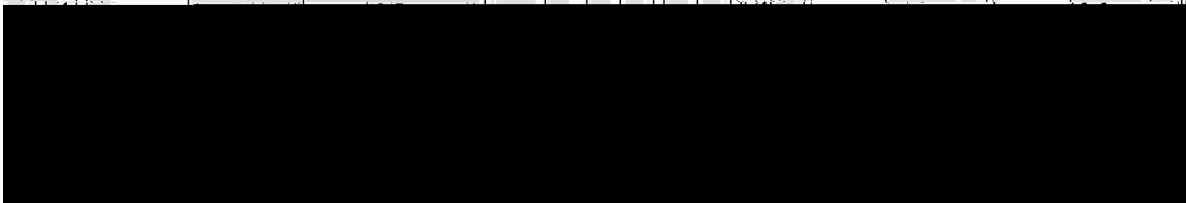
/ Electrical Characteristic Curve



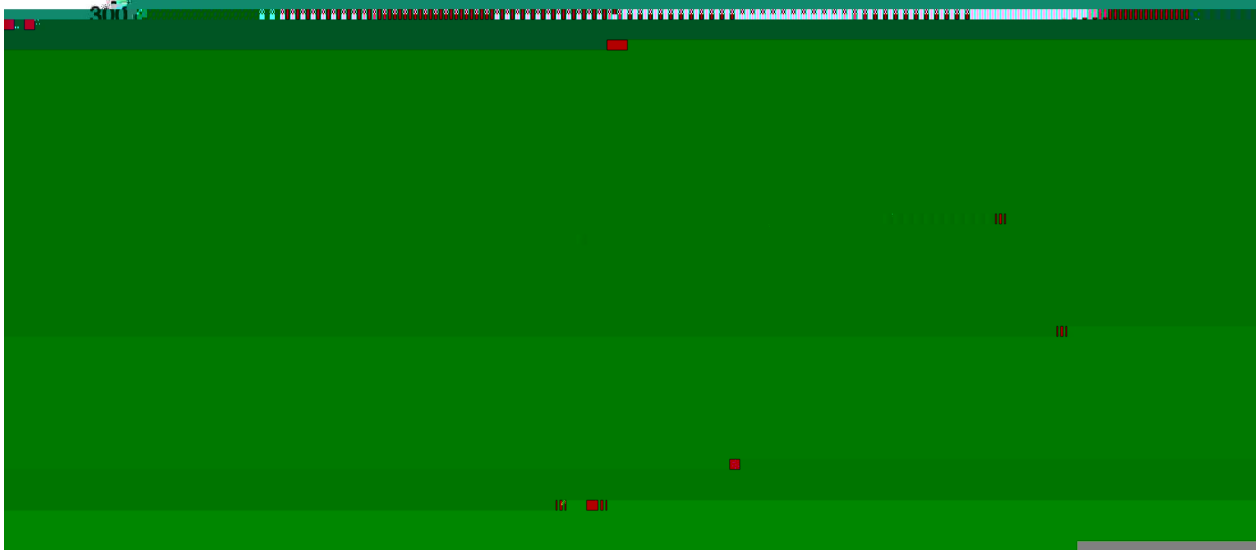
/ Package Dimensions



| Symbol | Dimension | Min | Max | Symbol | Dimension | Min | Max |
|--------|--------------|-----|------|--------|--------------|------|------|
| A | Lead Length | 9.8 | 10.2 | C | Lead Spacing | 15.7 | 16.1 |
| B | Lead Width | 6.3 | 6.7 | b | Lead Pitch | 12.6 | 13.6 |
| b | Lead Width | 9.0 | 9.4 | | | | |
| C1 | Lead Spacing | 2.2 | 2.6 | | | | |



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



- | | | | | | | |
|---|-------|-----|-----------|--------|---|--------------------------------------|
| 1 | 25 | 150 | 60 | 90sec; | Note: | 1.Preheating:25~150 , Time:60~90sec. |
| 2 | 255±5 | | 5±0.5sec; | | 2.Peak Temp.:255±5 Unit, 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 | 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 | 135x190 | 237x172x102 | 560x245x195 |

/ TUBE

Units

Dimension