

**/ Descriptions**

TO-252            N

N-CHANNEL MOSFET in a TO-252 Plastic Package.

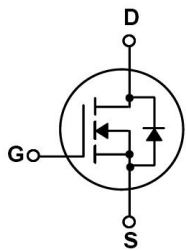
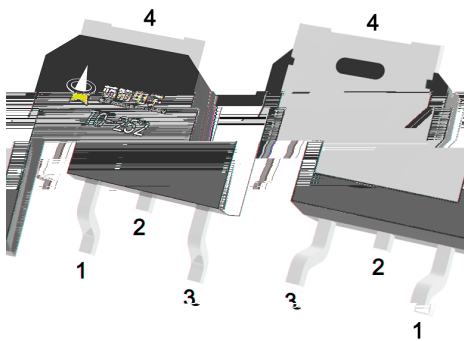
**/ Features** $V_{DS} (V) = 60V$      $I_D = 132A (V_{GS} = \pm 20V)$  $R_{DS(ON)} @ 10V \leq 3.6m\Omega (Typ. 3.45m\Omega)$ 

HF Product.

**/ Applications**

DC/DC

Suited for low voltage applications such as automotive, DC/DC Converters, and high efficiency switching for power management in portable and battery operated products.

**/ Equivalent Circuit****/ Pinning**

PIN1   G

PIN 2   D

PIN 3   S

PIN 4   D

**/ Marking**

See Marking Instructions.

## / Absolute Maximum Ratings(Ta=25 )

| Parameter                               |              | Symbol                        | Rating   | Unit                 |
|-----------------------------------------|--------------|-------------------------------|----------|----------------------|
| Drain-Source Voltage                    |              | $V_{DS}$                      | 60       | V                    |
| Drain Current                           |              | $I_D(T_c=25^{\circ}\text{C})$ | 132      | A                    |
| Drain Current - Pulsed                  |              | $I_{DM}$                      | 296      | A                    |
| Gate-Source Voltage                     |              | $V_{GS}$                      | $\pm 20$ | V                    |
| Avalanche Current                       |              | $I_{AS}$                      | 44       | A                    |
| Single Pulsed Avalanche Energy(L=0.5mH) |              | $E_{AS}$                      | 677.6    | mJ                   |
| Power Dissipation                       |              | $P_D(T_c=25^{\circ}\text{C})$ | 113      | W                    |
| Storage Temperature Range               |              | $T_{stg}$                     | -55~150  |                      |
| Thermal Resistance-Junction to Ambient  | $t \leq 10s$ | $R_{\theta JA}$               | 20       | $^{\circ}\text{C/W}$ |
|                                         | Steady-State |                               | 50       |                      |
| Thermal Resistance-Junction to Case     | Steady-State | $R_{\theta JC}$               | 1.1      |                      |

## / Electrical Characteristics(Ta=25 )

| Parameter                          | Symbol       | Test Conditions                            | Min | Typ  | Max       | Unit       |
|------------------------------------|--------------|--------------------------------------------|-----|------|-----------|------------|
| Drain-Source Breakdown Voltage     | $BV_{DS}$    | $V_{GS}=0V$ $I_D=250\mu A$                 | 60  | 69   |           | V          |
| Zero Gate Voltage Drain Current    | $I_{DSS}$    | $V_{DS}=60V$ $V_{GS}=0V$                   |     |      | 1.0       | $\mu A$    |
| Gate-Body Leakage Current Forward  | $I_{GSS}$    | $V_{GS}=\pm 20V$ $V_{DS}=0V$               |     |      | $\pm 0.1$ | $\mu A$    |
| Gate Threshold Voltage             | $V_{GS(th)}$ | $V_{DS}=V_{GS}$ $I_D=250\mu A$             | 2.0 | 3.0  | 4.0       | V          |
| Static Drain-Source On-Resistance  | $R_{DS(on)}$ | $V_{GS}=10V$ $I_D=20A$                     |     | 3.45 | 3.6       | m $\Omega$ |
| Drain-Source Diode Forward Voltage | $V_{SD}$     | $V_{GS}=0V$ $I_S=1A$                       |     |      | 1.2       | V          |
| Gate resistance                    | $R_g$        | $V_{GS}=0V$ $V_{DS}=0V$ ,<br>$f=1MHz$      |     | 1.0  |           | $\Omega$   |
| Input Capacitance                  | $C_{iss}$    | $V_{DS}=25V$ $V_{GS}=0V$<br>$f=1.0MHz$     |     | 4380 |           | pF         |
| Output Capacitance                 | $C_{oss}$    |                                            |     | 1350 |           |            |
| Reverse Transfer Capacitance       | $C_{rss}$    |                                            |     | 75   |           |            |
| Total Gate Charge                  | $Q_{g(10V)}$ | $V_{GS}=10V$ , $V_{DS}=30V$ ,<br>$I_D=20A$ |     | 43   |           | nC         |
| Gate Source Charge                 | $Q_{gs}$     |                                            |     | 13.1 |           |            |
| Gate Drain Charge                  | $Q_{gd}$     |                                            |     | 10.5 |           |            |

# BRCS035N06SHDP

Rev.A Apr.-2024



## DATA SHEET

| Parameter          | Symbol      | Test Conditions                                                    | Min | Typ  | Max | Unit |
|--------------------|-------------|--------------------------------------------------------------------|-----|------|-----|------|
| Turn-On Delay Time | $t_{d(on)}$ |                                                                    |     | 15.2 |     |      |
| Turn-On Rise Time  | $t$         | $V_{GS}=10V$ $V_{DS}=30V$<br>$R_L=1.5\ \Omega$ $R_{GEN}=3\ \Omega$ |     |      |     | ns   |

## / Electrical Characteristic Curve

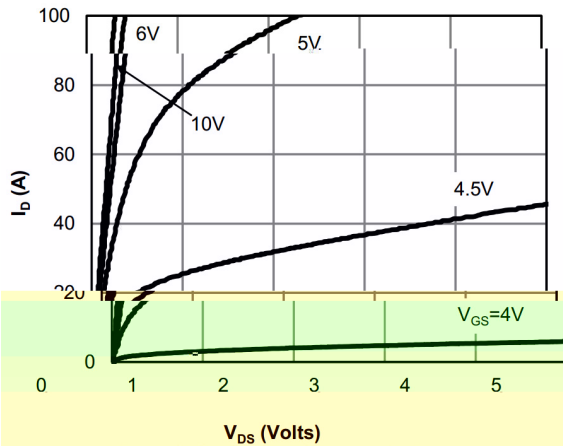


Figure 1: On-Region Characteristics

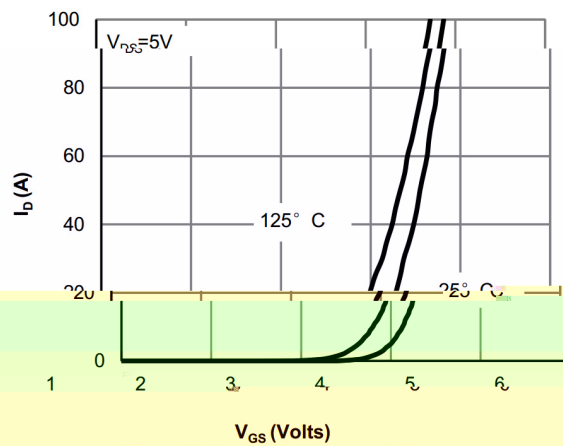


Figure 2: Transfer Characteristics

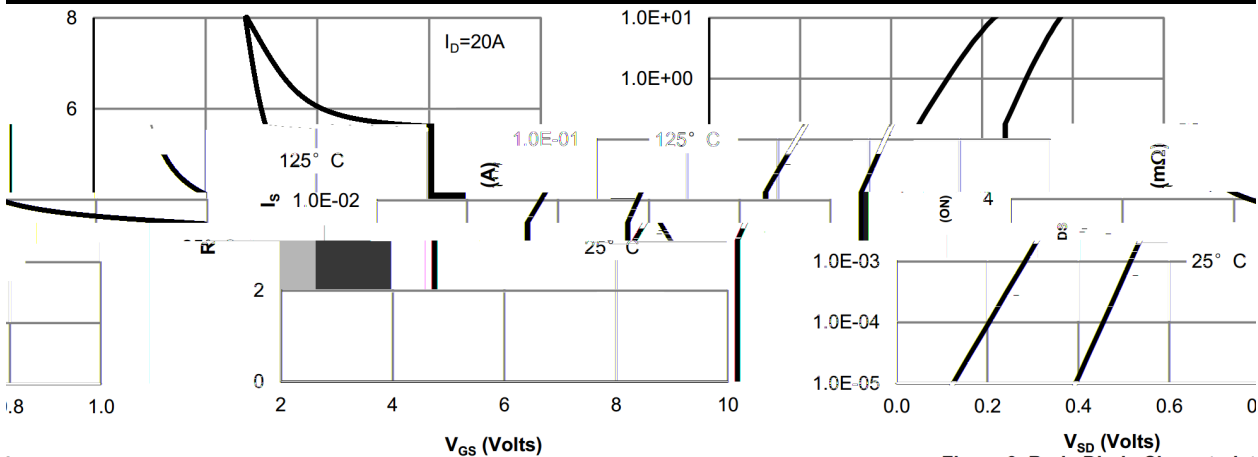
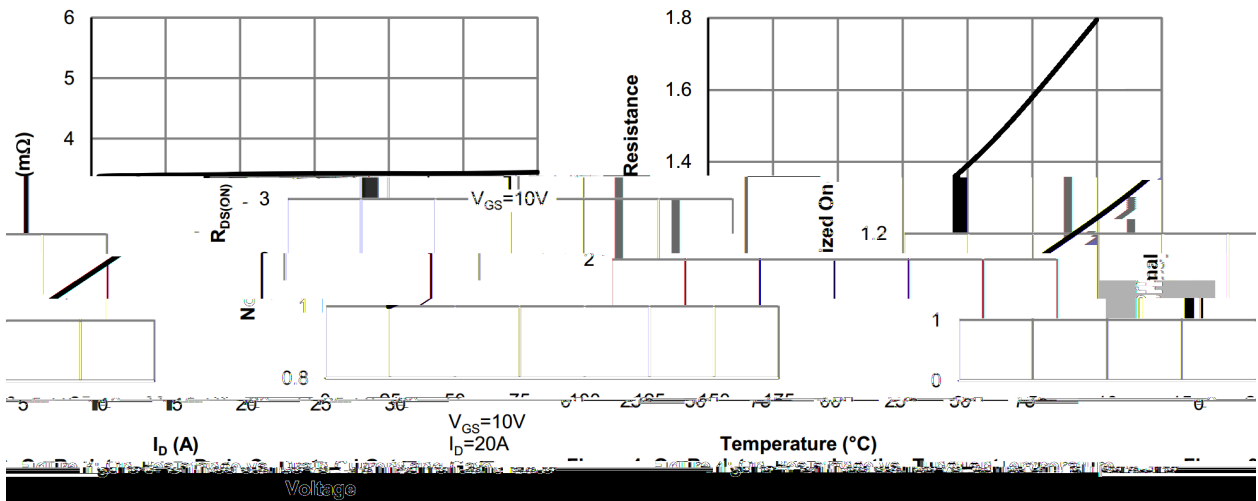
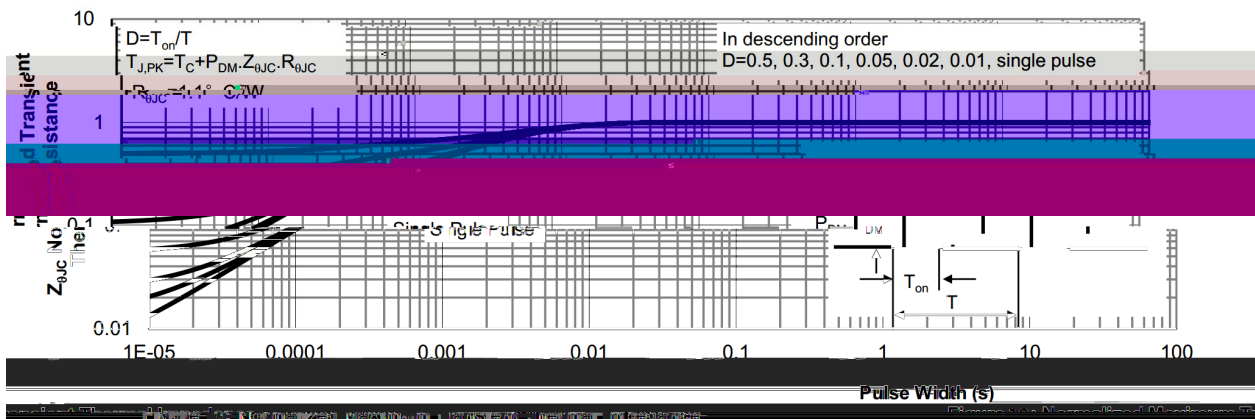
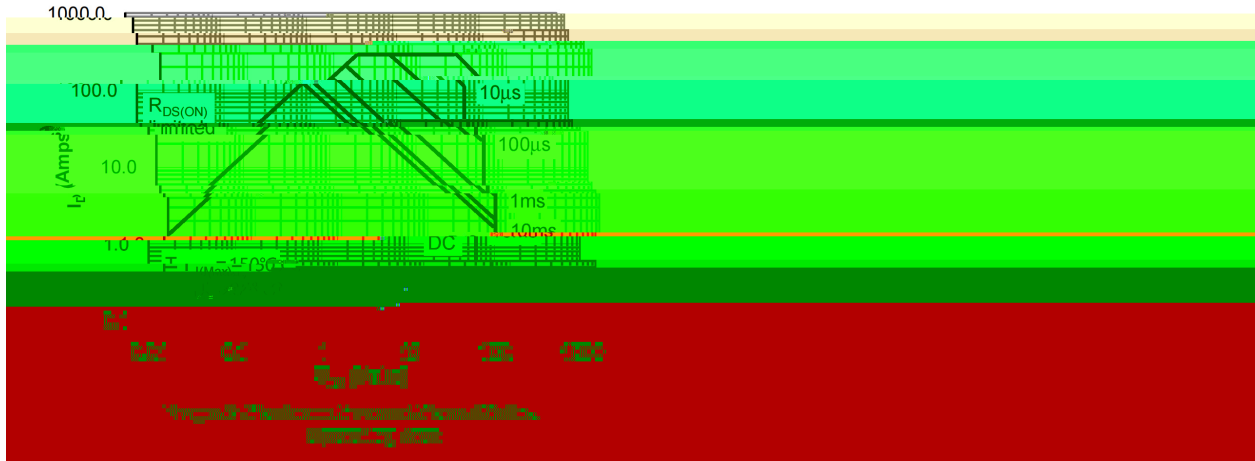
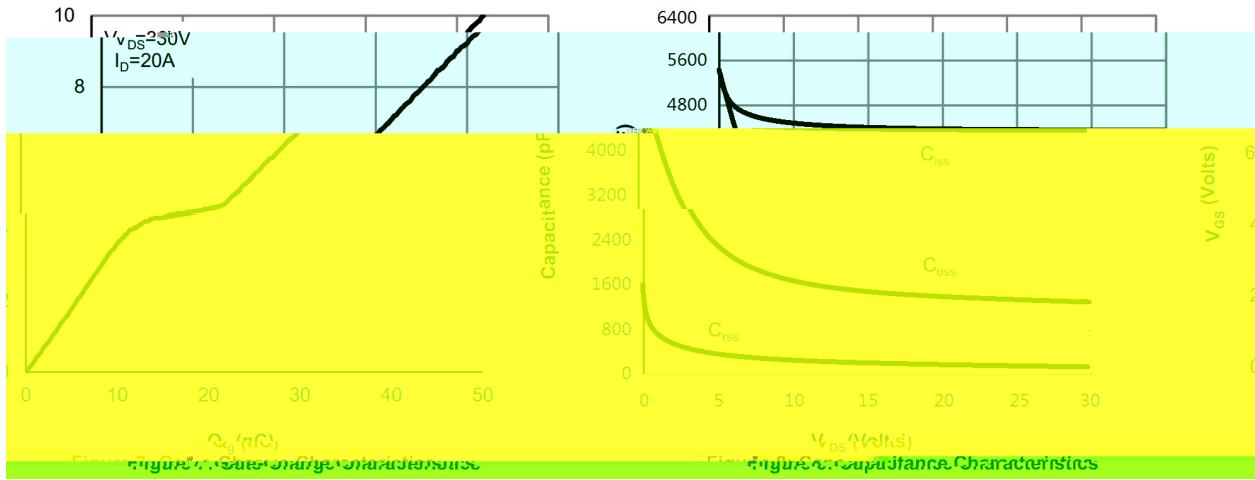


Figure 4: Body Diode Characteristics

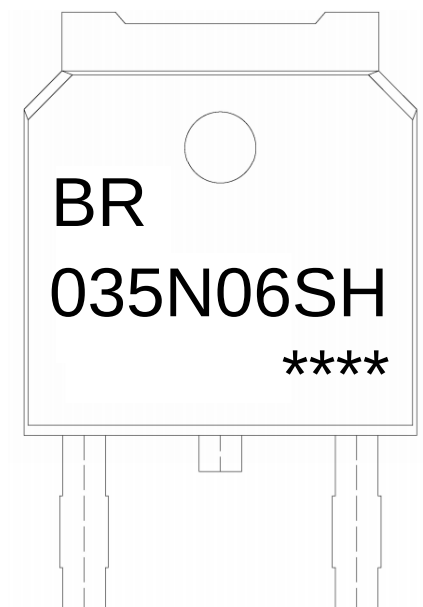
/ Electrical Characteristic Curve







**/ Marking Instructions**



BR

035N06SH

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Note:

BR: Company Code

035N06SH: Product Type Code

\*\*\*\*: Lot No. Code, code change with Lot No

(     ) / Temperature Profile for IR Reflow Soldering(Pb-Free)

|  |
|--|
|  |
|  |
|  |
|  |
|  |
|  |
|  |

Note:

- 1

150 180

60 90sec;

1.Preheating:150~180 , Time:60~90sec.
- 2

245±5

5±0.5sec;

2.Peak Temp.:245±5 , Duration:5±0.5sec.
- 3

2 10 /sec.

3. Cooling Speed: 2~10 /sec.

/ Resistance to Soldering Heat Test Conditions

260±5                      10±1 sec.                      Temp.:260±5                      Time:10±1 sec

/ Packaging SPEC.

/ REEL

| Package Type | Units      |                 |                 |                       |                 | Dimension (unit mm <sup>3</sup> ) (inch) |           |           | Reel | Inner Box | Outer Box | TD20TT4 |
|--------------|------------|-----------------|-----------------|-----------------------|-----------------|------------------------------------------|-----------|-----------|------|-----------|-----------|---------|
|              | Units/Reel | Reels/Inner Box | Units/Inner Box | Inner Boxes/Outer Box | Units/Outer Box | Reel                                     | Inner Box | Outer Box |      |           |           |         |
| TO-252       | 2500       | 254.16          | 34f.480.10019   | 68                    | 31.48           | TD(     )                                | T4.7334   | 1.2222    |      |           |           |         |