

**/ Descriptions**

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

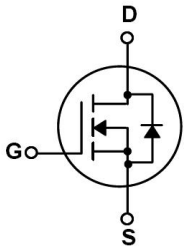
**/ Features**

$V_{DS}=200V$   $I_D=9A$   $V_{GS}=\pm 20V$   
 $R_{DS(on)}@10V$  0.4 (Type.0.35 )  
HF Product.

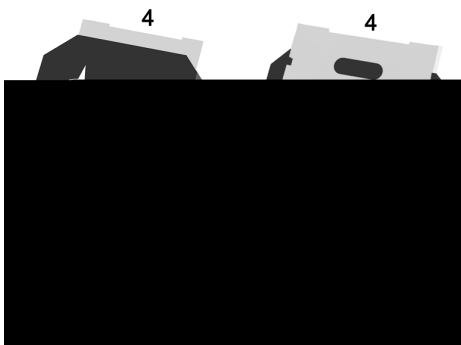
**/ Applications**

LED  
Networking,Load Switch,LED applications.

**/ 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                    | $V_{DSS}$      | 200        | V    |
| Drain Current                           | $I_D(T_C=25)$  | 9          | A    |
| Drain Current - Pulsed                  | $I_{DM}$       | 36         | A    |
| Gate-Source Voltage                     | $V_{GS}$       | $\pm 20$   | V    |
| Single Pulsed Avalanche Energy(L=10mH)  | $E_{AS}$       | 166        | mJ   |
| Avalanche Current(L=10mH)               | $I_{AS}$       | 5          | A    |
| Power Dissipation                       | $P_D(T_C=25)$  | 46         | W    |
| Operating and Storage Temperature Range | $T_J, T_{STG}$ | -55 to 150 |      |
| Maximum Junction-to-Ambient             | $R_{JA}$       | 100.3      | /W   |
| Maximum Junction-to-Case                | $R_{JC}$       | 2.7        |      |

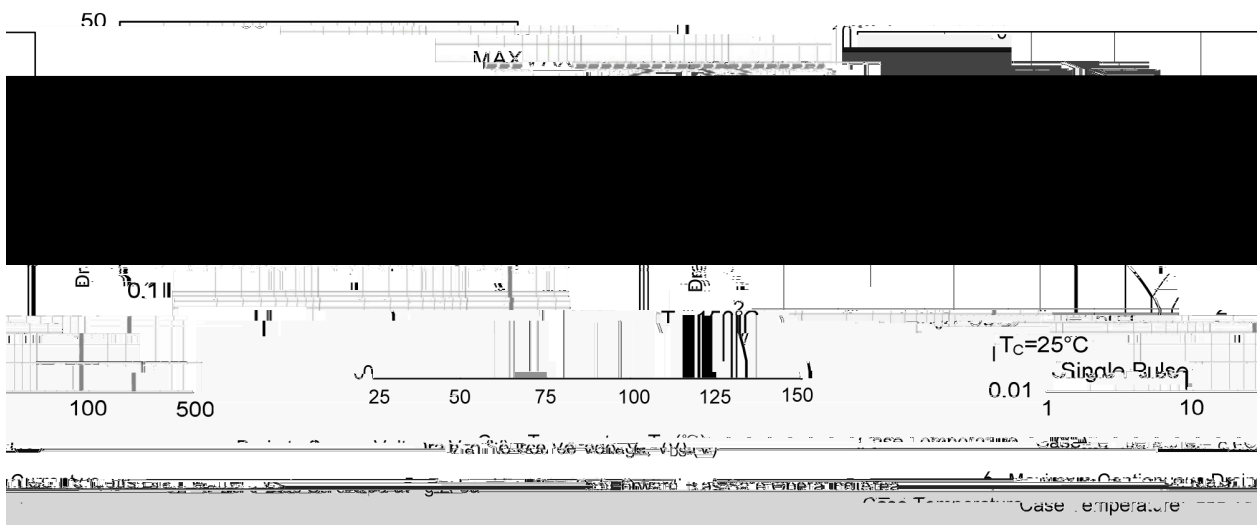
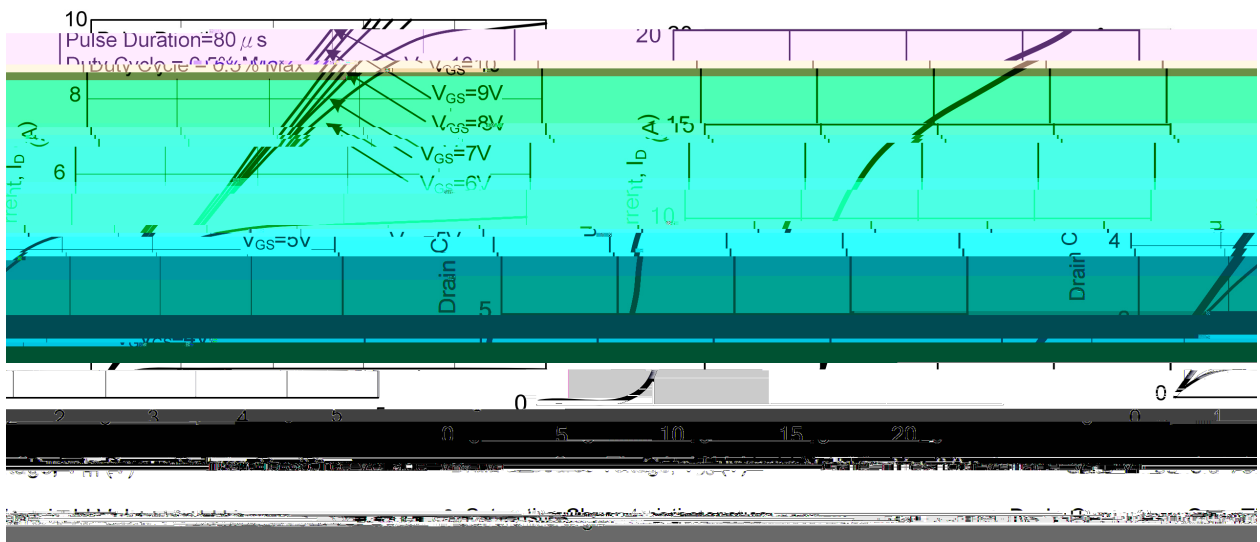
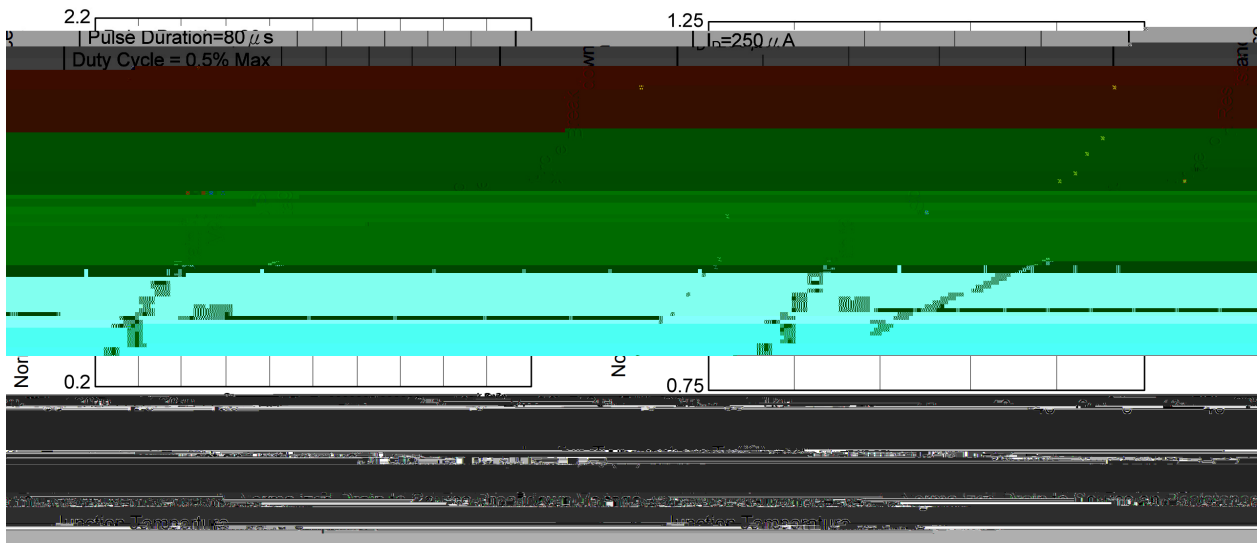
**/ Electrical Characteristics(Ta=25 )**

| Parameter                         | Symbol       | Test Conditions                                    | Min | Typ  | Max       | Unit |
|-----------------------------------|--------------|--|-----|------|-----------|------|
| Drain-Source Breakdown Voltage    | $BV_{DSS}$   | $V_{GS}=0V$ $I_D=250$ A                            | 200 |      |           | V    |
| Zero Gate Voltage Drain Current   | $I_{DSS}$    | $V_{DS}=200V$ $V_{GS}=0V$                          |     |      | 1         | A    |
| Gate-Body Leakage Current Forward | $I_{GSS}$    | $V_{GS}=\pm 20V$ $V_{DS}=0V$                       |     |      | $\pm 100$ | nA   |
| Gate Threshold Voltage            | $V_{GS(th)}$ | $V_{DS}=V_{GS}$ $I_D=250$ A                        | 2   | 3    | 4         | V    |
| Total gate charge                 | $R_{DS(on)}$ | $V_{GS}=10V$ $I_D=4.5A$                            |     | 0.35 | 0.4       |      |
| Gate resistance                   | $R_g$        | $V_{GS}=0V$ $f=1MHz$ $V_{DS}=0V,$                  |     | 1.7  |           |      |
| Input Capacitance                 | $C_{iss}$    | $V_{DS}=25V$ $V_{GS}=0V$ $f=1MHz$                  |     | 630  |           | pF   |
| Output Capacitance                | $C_{oss}$    |  |     | 270  |           |      |
| Reverse Transfer Capacitance      | $C_{rss}$    |  |     | 50   |           |      |
| Total Gate Charge                 | $Q_g$        | $V_{GS}=10V,$ $V_{DS}=160V,$ $I_G=1.5mA,$ $I_D=9A$ |     | 21   | 30        | nC   |
| Gate Source Charge                | $Q_{gs}$     |  |     | 11.2 | 20        |      |
| Gate Drain Charge                 | $Q_{gd}$     |  |     | 9.5  | 15        |      |



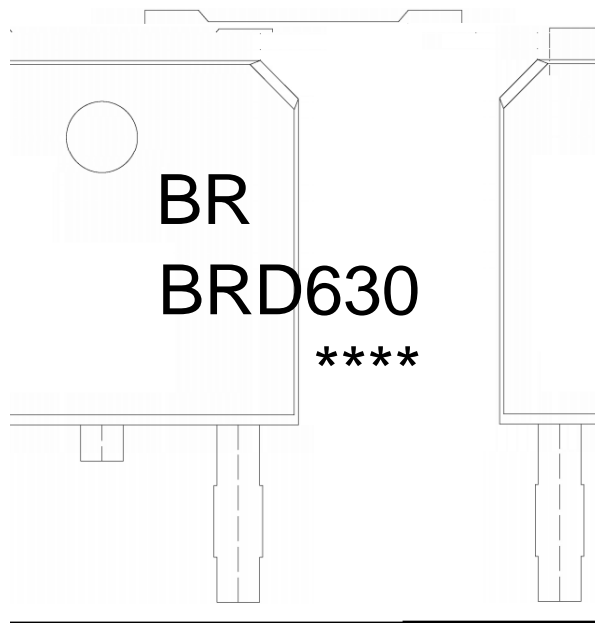
| Parameter   | Symbol       | Test Conditions                                      | Min | Typ | Max | Unit |
|---|--------------|--|-----|-----|-----|------|
| Turn-On Delay Time                                    | $t_{d(on)}$  | $V_{GS}=10V$ $V_{DS}=90V$<br>$R_L=9.6$ $R_{GEN}=9.1$ |     | 15  | 32  | ns   |
| Turn-On Rise Time                                     | $t_r$        |  |     | 33  | 53  |      |
| Turn-Off Delay Time                                   | $t_{d(off)}$ |  |     | 40  | 55  |      |
| Turn-Off Fall Time                                    | $t_f$        |  |     | 30  | 45  |      |
| Maximum Continuous Drain-Source Diode Forward Current | $I_S$        |  |     |     | 9   | A    |
| Maximum Pulsed Drain-Source Diode Forward Current     | $I_{SM}$     |  |     |     | 36  | A    |
| Drain-Source Diode Forward Voltage                    | $V_{SD}$     | $V_{GS} = 0 V,$ $I_S = 9.0A$                         |     |     | 1.2 | V    |
| Reverse Recovery Time                                 | $t_{rr}$     | $V_{GS} = 0V,$ $I_S = 9.0A,$<br>$dI_F/dt = 100 A/ s$ |     | 455 |     | nS   |
| Reverse Recovery Charge                               | $Q_{rr}$     |  |     |     | 3.5 |      |

/ Electrical Characteristic Curve





**/ Marking Instructions**



BR

BRD630

\*\*\*\*

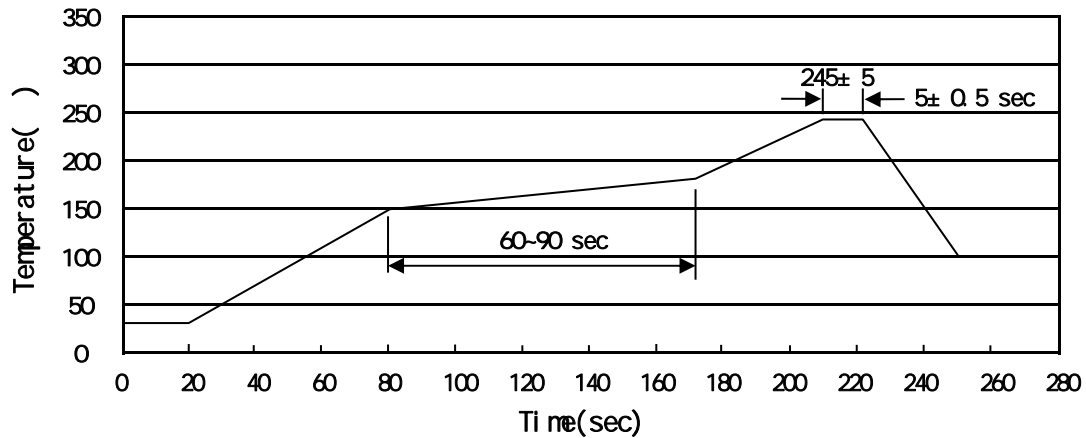
Note:

BR: Company Code

BRD630: 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> ) |            |             |
|--------------|------------|-----------------|-----------------|-----------------------|-----------------|-----------------------------------|------------|-------------|
|              | Units/Reel | Reels/Inner Box | Units/Inner Box | Inner Boxes/Outer Box | Units/Outer Box | Reel                              | Inner Box  | Outer Box   |
| TO-252       | 2,500      | 2               | 5,000           | 6                     | 30,000          | 13 x16                            | 360x360x50 | 380x335x366 |

/ TUBE

| Package Type | Units      |                 |                 |                       |                 | Dimension (unit mm <sup>3</sup> ) |            |             |
|--------------|------------|-----------------|-----------------|-----------------------|-----------------|-----------------------------------|------------|-------------|
|              | Units/Tube | Tubes/Inner Box | Units/Inner Box | Inner Boxes/Outer Box | Units/Outer Box | Tube                              | Inner Box  | Outer Box   |
| TO-251/252   | 75         | 48              | 3,600           | 5                     | 18,000          | 526x20.5x5.25                     | 555x164x50 | 575x290x180 |

/ Notices