

## / Descriptions

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

## / Features

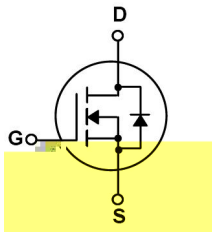
Low gate charge, low crss, fast switching.

## / Applications

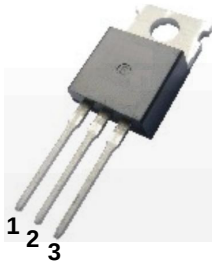
DC/DC

These devices are well suited for high efficiency switching DC/DC converters and switch mode power supplies.

## / Equivalent Circuit



## / Pinning



PIN1   G

PIN 2   D

PIN 3   S

## / $h_{FE}$ Classifications & Marking

See Marking Instructions.

### / Absolute Maximum Ratings(Ta=25 )

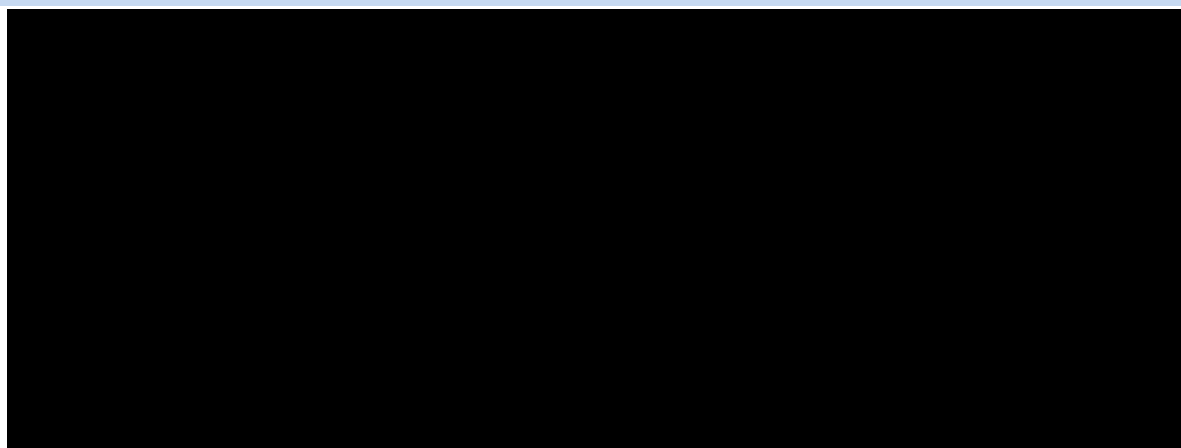
| Parameter                              | Symbol                  | Rating     | Unit |
|----------------------------------------|-------------------------|------------|------|
| Drain-Source Voltage                   | $V_{DSS}$               | 500        | V    |
| Drain Current                          | $I_D(T_C=25^{\circ}C)$  | 5.0        | A    |
|                                        | $I_D(T_C=100^{\circ}C)$ | 3.0        | A    |
| Pulsed Drain Current                   | $I_{DM}$                | 20         | A    |
| Gate-Source Voltage                    | $V_{GSS}$               | $\pm 30$   | V    |
| Avalanche Current                      | $I_{AR}$                | 5          | A    |
| Single Pulsed Avalanche Energy         | $E_{AS}$                | 292        | mJ   |
| Repetitive Avalanche Energy            | $E_{AR}$                | 8.75       | mJ   |
| Total Power Dissipation                | $P_D(T_C=25^{\circ}C)$  | 87.5       | W    |
| Junction and Storage Temperature Range | $T_J, T_{STG}$          | -55 to 150 |      |

### / Electrical Characteristics(Ta=25 )

| Parameter                         | Symbol       | Test Conditions                            | Min | Typ  | Max       | Unit     |
|-----------------------------------|--------------|--------------------------------------------|-----|------|-----------|----------|
| Zero Gate Voltage Drain Current   | $BV_{DSS}$   | $V_{GS}=0V$ $I_D=250\mu A$                 | 500 |      |           | V        |
| Zero Gate Voltage Drain Current   | $I_{DSS}$    | $V_{DS}=500V$ $V_{GS}=0V$                  |     |      | 10        | $\mu A$  |
|                                   |              | $V_{DS}=400V$ $T_C=125^{\circ}C$           |     |      | 100       | $\mu A$  |
| Gate-Body Leakage Current Forward | $I_{GSS}$    | $V_{GS}=\pm 30V$ $V_{DS}=0V$               |     |      | $\pm 0.1$ | $\mu A$  |
| Gate Threshold Voltage            | $V_{GS(th)}$ | $V_{DS}=V_{GS}$ $I_D=250\mu A$             | 2.0 |      | 4.0       | V        |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=10V$ $I_D=2.5A$                    |     | 1.15 | 1.4       | $\Omega$ |
| Forward Transconductance          | $g_{FS}$     | $V_{DS}=40V$ $I_D=2.5A$                    |     | 4.2  |           | S        |
| Forward On Voltage                | $V_{SD}$     | $V_{GS}=0V$ $I_S=5.0A$                     |     |      | 1.5       | V        |
| Input Capacitance                 | $C_{iss}$    | $V_{DS}=25V$ $V_{GS}=0V$<br>$f=1.0MHz$     |     | 680  | 900       | pF       |
| Output Capacitance                | $C_{oss}$    |                                            |     | 85   | 110       |          |
| Reverse Transfer Capacitance      | $C_{rss}$    |                                            |     | 15   | 20        |          |
| Turn-On Delay Time                | $t_{d(on)}$  | $V_{DD}=250V$ $I_D=5.0A$<br>$R_G=25\Omega$ |     | 20   | 50        | ns       |
| Turn-On Rise Time                 | $t_r$        |                                            |     | 40   | 90        |          |
| Turn-Off Delay Time               | $t_{d(off)}$ |                                            |     | 90   | 190       |          |
| Turn-Off Fall Time                | $t_f$        |                                            |     | 45   | 100       |          |

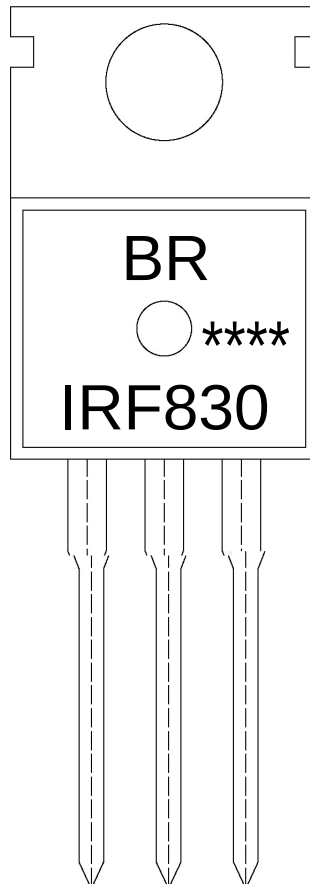


# Package Dimensions



| Dimensions in Millimeters |      |      | Dimensions in Millimeters |      |      |
|---------------------------|------|------|---------------------------|------|------|
| Symbol                    | Min  | Max  | Symbol                    | Min  | Max  |
| $\Delta$                  | 9.8  | 10.2 | C                         | 1.2  | 1.4  |
| $\phi$                    | 2.56 | 3.36 | $\phi$                    | 1.3  | 3.37 |
| $\phi$                    | 15.7 | 16.1 | B                         | 9.0  | 9.4  |
| b                         | 12.6 | 13.6 | C1                        | 2.2  | 2.6  |
| b1                        | 9.6  | 10.6 | a1                        | 0.7  | 0.9  |
| $\phi$                    | 3.1  | 3.2  | $\phi$                    | 0.6  | 0.7  |
| E                         | 2.34 | 2.74 | $\phi$                    | 0.2  | 0.3  |
| $\phi$                    | 0.2  | 1.25 |                           | 1.45 |      |

/ Marking Instructions



BR

IRF830

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Note:

BR: Company Code

IRF830: Product Type.

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

