

### / Descriptions

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

### / Features

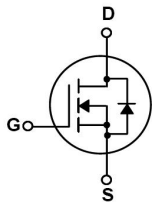
Low gate charge, low crss, fast switching.

### / 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.

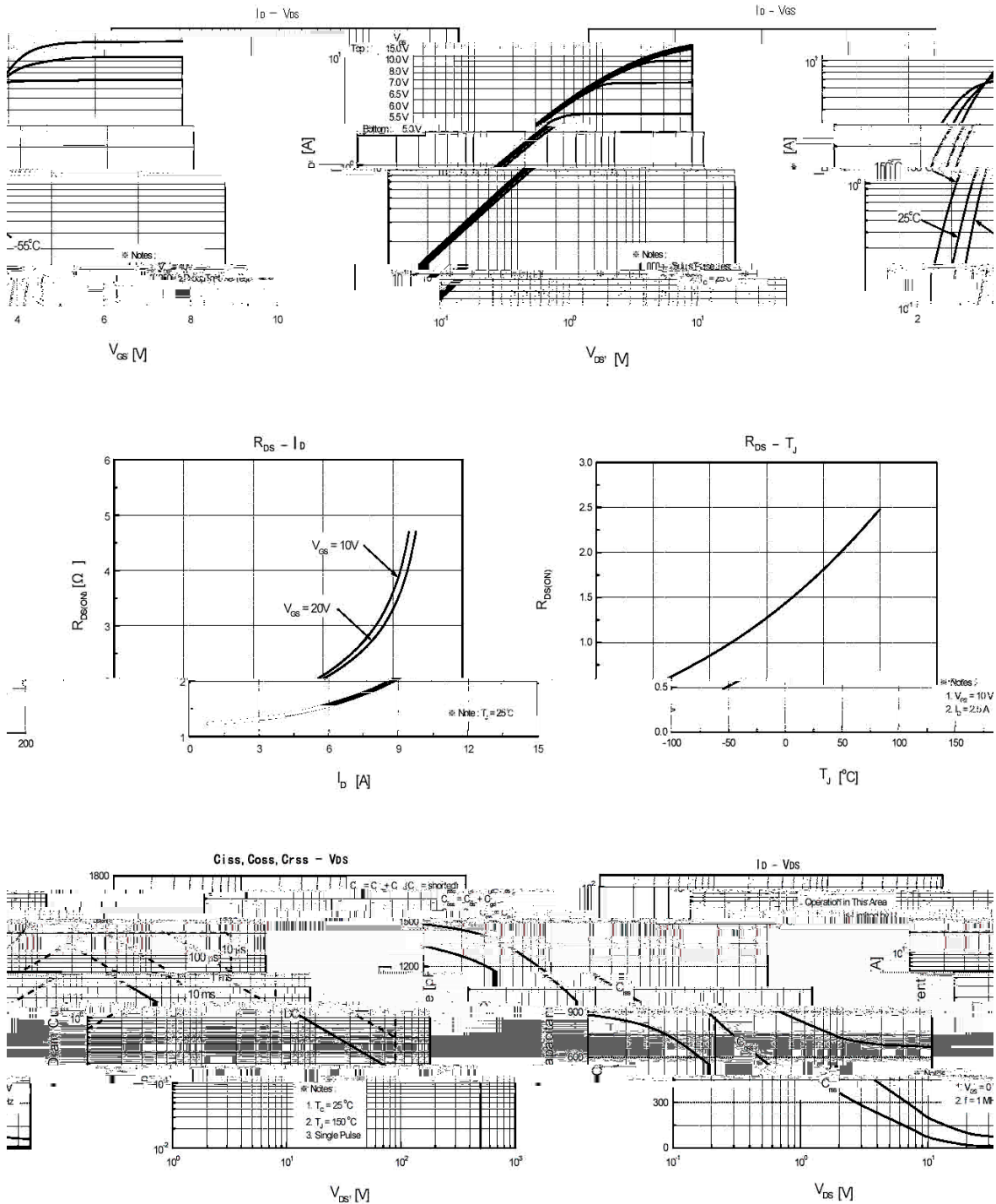
**/ Absolute Maximum Ratings(Ta=25 )**

| Parameter                               | Symbol         | Rating     | Unit |
|-----------------------------------------|----------------|------------|------|
| Drain-Source Voltage                    | $V_{DSS}$      | 500        | V    |
| Drain Current                           | $I_D(T_C=25)$  | 5.0        | A    |
| Drain Current                           | $I_D(T_C=100)$ | 3.0        | A    |
| Drain Current - Pulsed                  | $I_{DM}$       | 20         | A    |
| Gate-Source Voltage                     | $V_{GSS}$      | $\pm 30$   | V    |
| Avalanche Current                       | $I_{AR}$       | 4.5        | A    |
| Single Pulsed Avalanche Energy          | $E_{AS}$       | 292        | mJ   |
| Repetitive Avalanche Energy             | $E_{AR}$       | 8.75       | mJ   |
| Power Dissipation                       | $P_D(T_C=25)$  | 38         | W    |
| Operating and Storage Temperature Range | $T_J, T_{STG}$ | -55 to 150 |      |

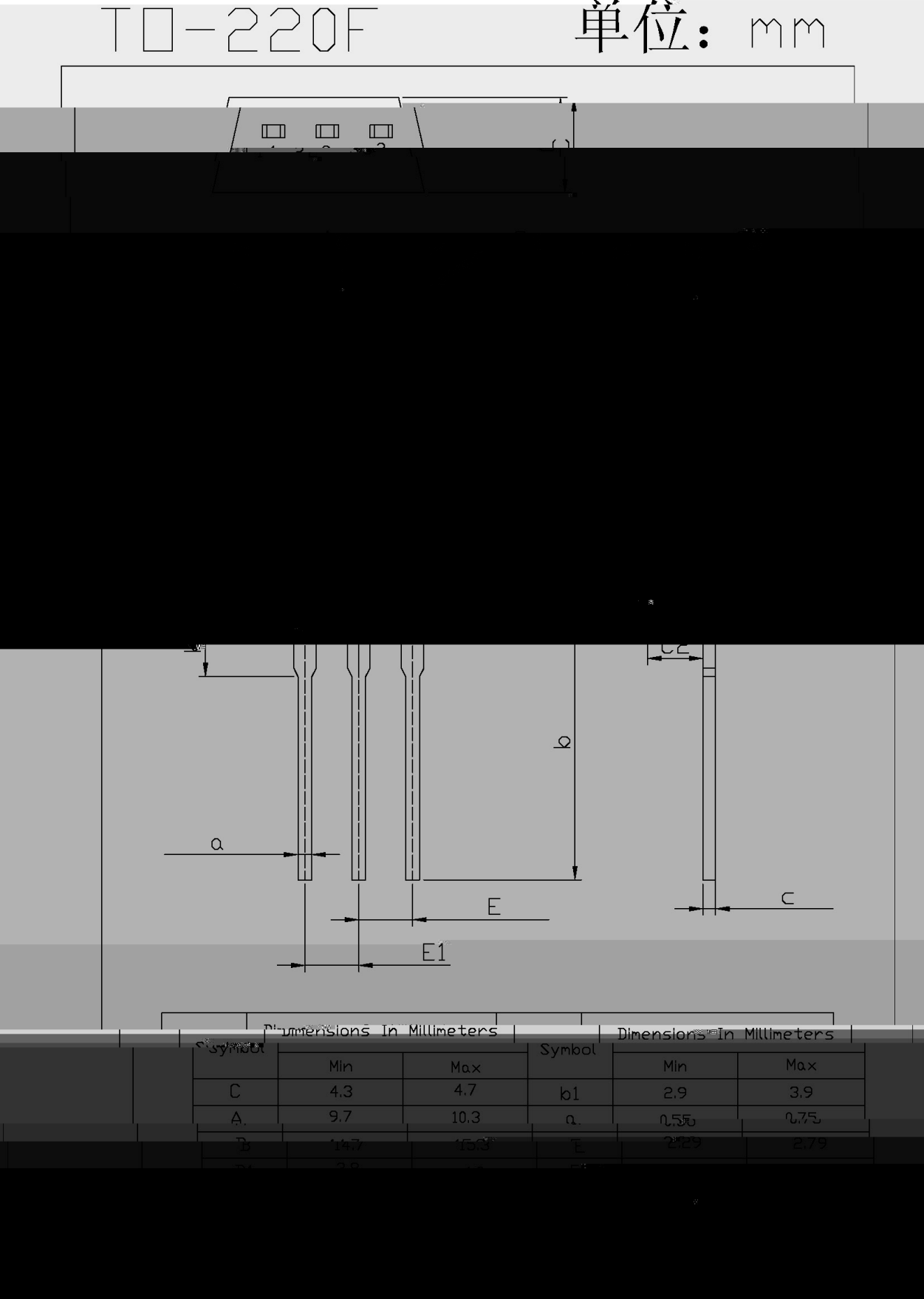
**/ Electrical Characteristics(Ta=25 )**

| Parameter                          | Symbol       | Test Conditions                            | Min | Typ  | Max       | Unit     |
|------------------------------------|--------------|--------------------------------------------|-----|------|-----------|----------|
| Drain-Source Breakdown Voltage     | $BV_{DSS}$   | $V_{GS}=0V$ $I_D=250\mu A$                 | 500 |      |           | V        |
| Zero Gate Voltage Drain Current    | $I_{DSS}$    | $V_{DS}=500V$ $V_{GS}=0V$                  |     |      | 10        | $\mu A$  |
|                                    |              | $V_{DS}=400V$ $T_C=125$                    |     |      | 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        |
| Drain-Source Diode Forward 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                 | $t_{d(on)}$  | $V_{DD}=250V$ $I_D=4.5A$<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       |          |

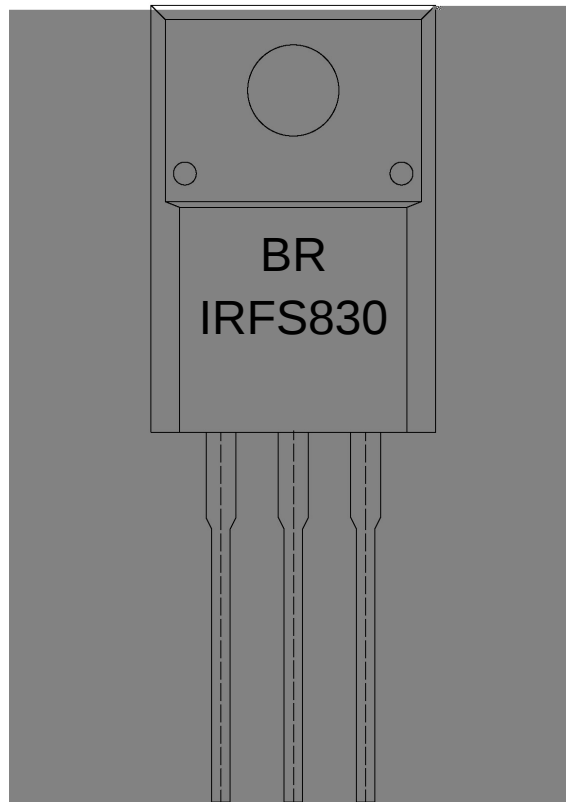
**/ Electrical Characteristic Curve**



/ Package Dimensions



**/ Marking Instructions**



BR

IRFS830

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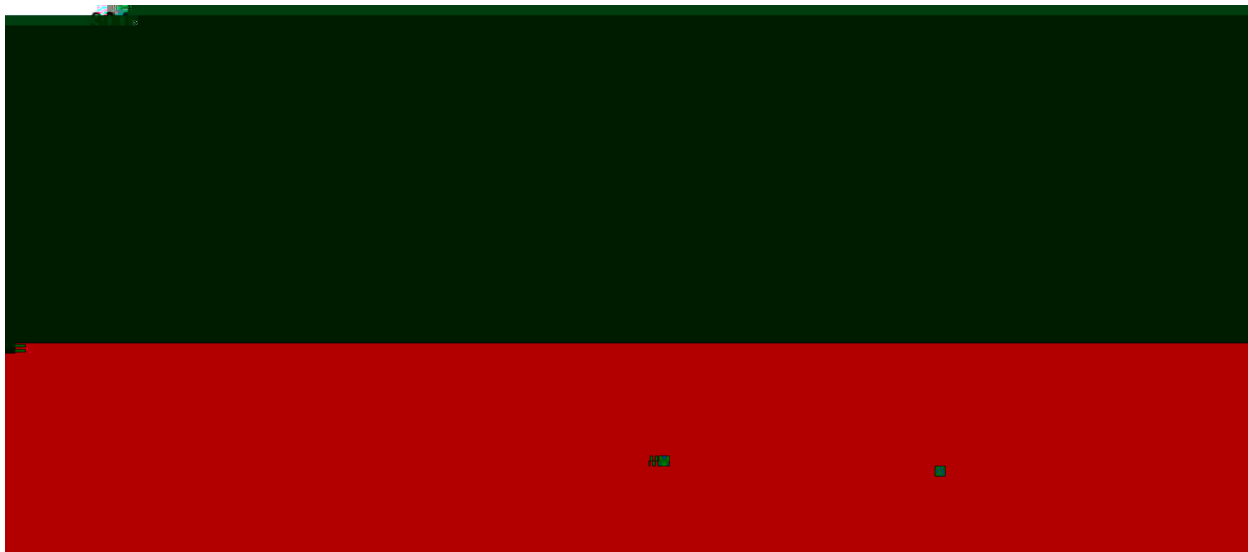
Note:

BR: Company Code

IRFS830: Product Type.

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

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



Note:

- |   |       |     |           |                                         |                                      |
|---|-------|-----|-----------|-----------------------------------------|--------------------------------------|
| 1 | 25    | 150 | 60        | 90sec;                                  | 1.Preheating:25~150 , Time:60~90sec. |
| 2 | 255±5 |     | 5±0.5sec; | 2.Peak Temp.:255±5 , 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 <sup>3</sup> ) |  |  |
|--------------|-------|--|--|--|--|-----------------------------------|--|--|
|              |       |  |  |  |  |                                   |  |  |
|              |       |  |  |  |  |                                   |  |  |

/ TUBE

| Package Type | Units |  |  |  |  | Dimension (unit mm <sup>3</sup> ) |  |  |
|--------------|-------|--|--|--|--|-----------------------------------|--|--|
|              |       |  |  |  |  |                                   |  |  |
|              |       |  |  |  |  |                                   |  |  |

/ Notices