

**GJ9962****N-CHANNEL ENHANCEMENT MODE POWER MOSFET**

|         |      |
|---------|------|
| BVDSS   | 40V  |
| RDS(ON) | 20mΩ |
| ID      | 32A  |

**Description**

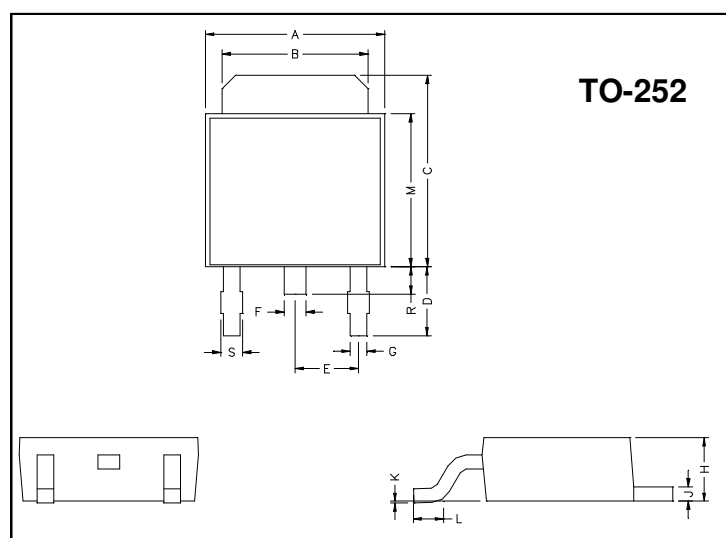
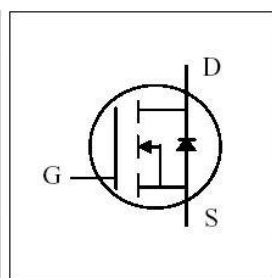
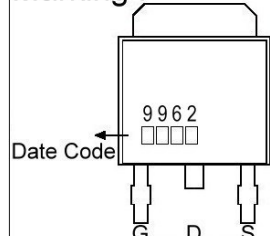
The GJ9962 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The TO-252 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

**Features**

\*Low On-resistance

\*Single Drive Requirement

**Package Dimensions****Marking :**

| REF. | Millimeter |      | REF. | Millimeter |      |
|------|------------|------|------|------------|------|
|      | Min.       | Max. |      | Min.       | Max. |
| A    | 6.40       | 6.80 | G    | 0.50       | 0.70 |
| B    | 5.20       | 5.50 | H    | 2.20       | 2.40 |
| C    | 6.80       | 7.20 | J    | 0.45       | 0.55 |
| D    | 2.40       | 3.00 | K    | 0          | 0.15 |
| E    | 2.30 REF.  |      | L    | 0.90       | 1.50 |
| F    | 0.70       | 0.90 | M    | 5.40       | 5.80 |
| S    | 0.60       | 0.90 | R    | 0.80       | 1.20 |

**Absolute Maximum Ratings**

| Parameter                                        | Symbol                  | Ratings    | Unit |
|--------------------------------------------------|-------------------------|------------|------|
| Drain-Source Voltage                             | $V_{DS}$                | 40         | V    |
| Gate-Source Voltage                              | $V_{GS}$                | ±20        | V    |
| Continuous Drain Current, $V_{GS}@10V$           | $I_D @T_C=25^{\circ}C$  | 32         | A    |
| Continuous Drain Current, $V_{GS}@10V$           | $I_D @T_C=100^{\circ}C$ | 20         | A    |
| Pulsed Drain Current <sup>1</sup>                | $I_{DM}$                | 150        | A    |
| Total Power Dissipation                          | $P_D @T_C=25^{\circ}C$  | 34.7       | W    |
| Linear Derating Factor                           |                         | 0.27       | W/°C |
| Operating Junction and Storage Temperature Range | $T_j, T_{stg}$          | -55 ~ +150 | °C   |

**Thermal Data**

| Parameter                                | Symbol      | Value | Unit |
|------------------------------------------|-------------|-------|------|
| Thermal Resistance Junction-case Max.    | $R_{thj-c}$ | 4.5   | °C/W |
| Thermal Resistance Junction-ambient Max. | $R_{thj-a}$ | 110   | °C/W |

**Electrical Characteristics (T<sub>j</sub> = 25°C unless otherwise specified)**

| Parameter                                           | Symbol                         | Min. | Typ. | Max. | Unit | Test Conditions                                                                                                     |
|-----------------------------------------------------|--------------------------------|------|------|------|------|---------------------------------------------------------------------------------------------------------------------|
| Drain-Source Breakdown Voltage                      | BV <sub>DSS</sub>              | 40   | -    | -    | V    | V <sub>GS</sub> =0, I <sub>D</sub> =250uA                                                                           |
| Breakdown Voltage Temperature Coefficient           | $\Delta BV_{DSS} / \Delta T_j$ | -    | 0.1  | -    | V/°C | Reference to 25°C, I <sub>D</sub> =1mA                                                                              |
| Gate Threshold Voltage                              | V <sub>GS(th)</sub>            | 1.0  | -    | 3.0  | V    | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA                                                            |
| Forward Transconductance                            | g <sub>fs</sub>                | -    | 19   | -    | S    | V <sub>DS</sub> =10V, I <sub>D</sub> =20A                                                                           |
| Gate-Source Leakage Current                         | I <sub>GSS</sub>               | -    | -    | ±100 | nA   | V <sub>GS</sub> = ±20V                                                                                              |
| Drain-Source Leakage Current(T <sub>j</sub> =25°C)  | I <sub>DSS</sub>               | -    | -    | 1    | uA   | V <sub>DS</sub> =40V, V <sub>GS</sub> =0                                                                            |
| Drain-Source Leakage Current(T <sub>j</sub> =150°C) |                                | -    | -    | 25   | uA   | V <sub>DS</sub> =32V, V <sub>GS</sub> =0                                                                            |
| Static Drain-Source On-Resistance <sup>2</sup>      | R <sub>DS(ON)</sub>            | -    | -    | 20   | mΩ   | V <sub>GS</sub> =10V, I <sub>D</sub> =20A                                                                           |
|                                                     |                                | -    | -    | 30   |      | V <sub>GS</sub> =4.5V, I <sub>D</sub> =16A                                                                          |
| Total Gate Charge <sup>2</sup>                      | Q <sub>g</sub>                 | -    | 13   | 21   | nC   | I <sub>D</sub> =20A<br>V <sub>DS</sub> =32V<br>V <sub>GS</sub> =4.5V                                                |
| Gate-Source Charge                                  | Q <sub>gs</sub>                | -    | 5    | -    |      |                                                                                                                     |
| Gate-Drain ("Miller") Charge                        | Q <sub>gd</sub>                | -    | 8    | -    |      |                                                                                                                     |
| Turn-on Delay Time <sup>2</sup>                     | T <sub>d(on)</sub>             | -    | 8    | -    | ns   | V <sub>DS</sub> =20V<br>I <sub>D</sub> =20A<br>V <sub>GS</sub> =10V<br>R <sub>G</sub> =3.3Ω<br>R <sub>D</sub> =1.0Ω |
| Rise Time                                           | T <sub>r</sub>                 | -    | 38   | -    |      |                                                                                                                     |
| Turn-off Delay Time                                 | T <sub>d(off)</sub>            | -    | 20   | -    |      |                                                                                                                     |
| Fall Time                                           | T <sub>f</sub>                 | -    | 5    | -    |      |                                                                                                                     |
| Input Capacitance                                   | C <sub>iss</sub>               | -    | 1170 | 1870 | pF   | V <sub>GS</sub> =0V<br>V <sub>DS</sub> =25V<br>f=1.0MHz                                                             |
| Output Capacitance                                  | C <sub>oss</sub>               | -    | 180  | -    |      |                                                                                                                     |
| Reverse Transfer Capacitance                        | C <sub>rss</sub>               | -    | 115  | -    |      |                                                                                                                     |

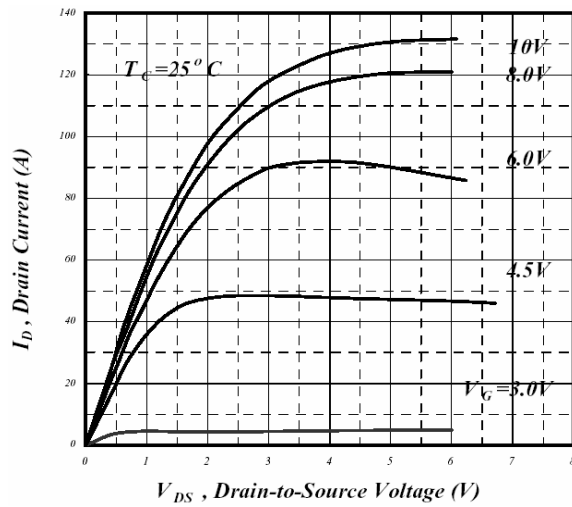
**Source-Drain Diode**

| Parameter                       | Symbol          | Min. | Typ. | Max. | Unit | Test Conditions                                           |
|---------------------------------|-----------------|------|------|------|------|-----------------------------------------------------------|
| Forward On Voltage <sup>2</sup> | V <sub>SD</sub> | -    | -    | 1.2  | V    | I <sub>S</sub> =32A, V <sub>GS</sub> =0V                  |
| Reverse Recovery Time           | T <sub>rr</sub> | -    | 24   | -    | ns   | I <sub>S</sub> =20A, V <sub>GS</sub> =0V<br>dI/dt=100A/μs |
| Reverse Recovery Charge         | Q <sub>rr</sub> | -    | 14   | -    | nC   |                                                           |

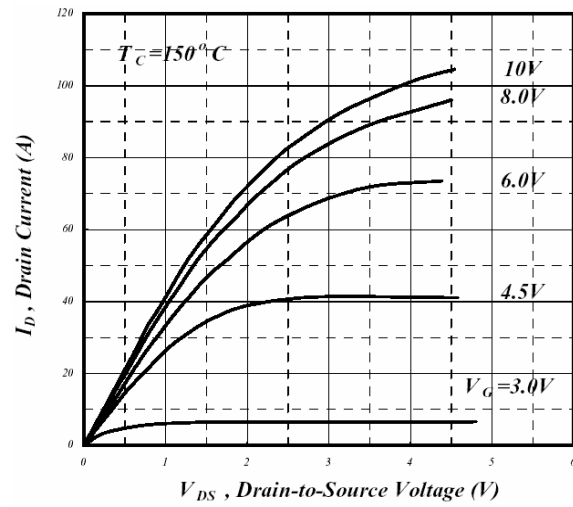
Notes: 1. Pulse width limited by Max. junction temperature.

2. Pulse width ≤ 300us, duty cycle ≤ 2%.

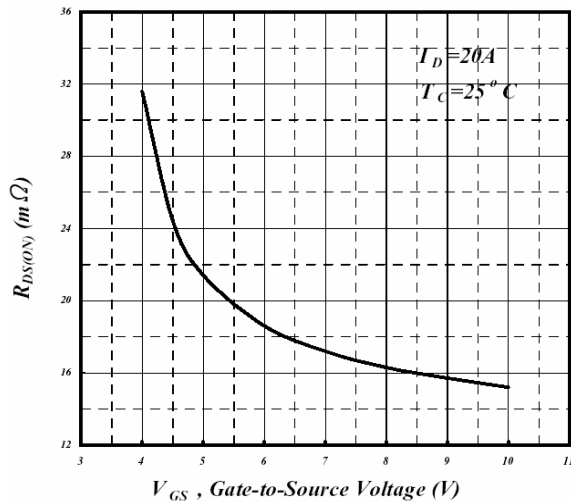
## Characteristics Curve



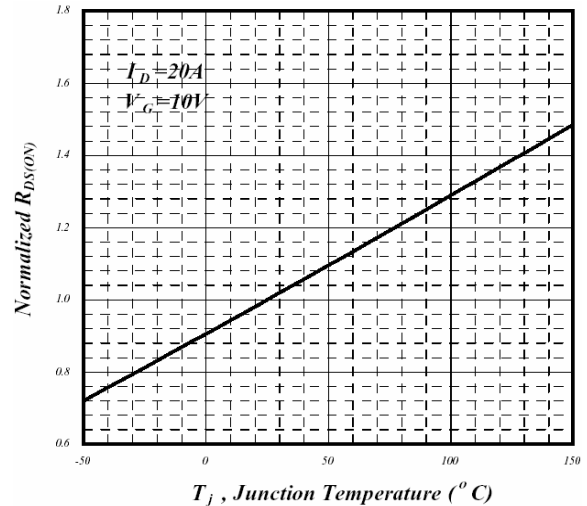
**Fig 1. Typical Output Characteristics**



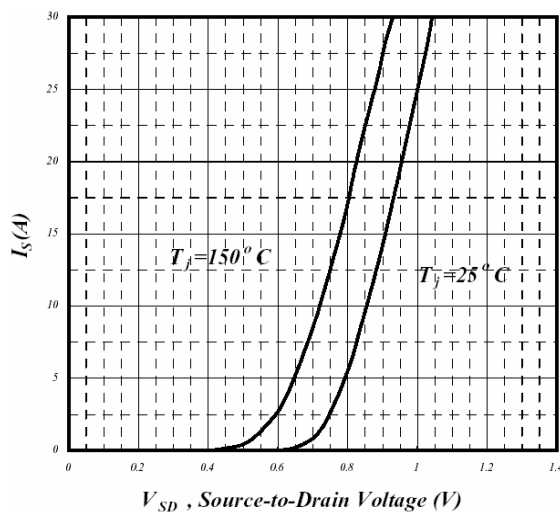
**Fig 2. Typical Output Characteristics**



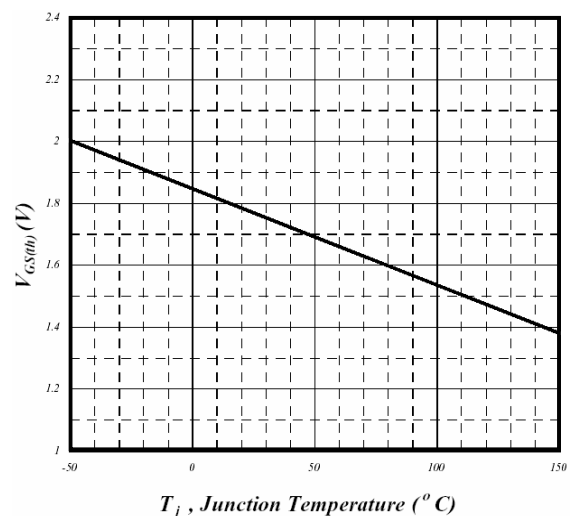
**Fig 3. On-Resistance v.s. Gate Voltage**



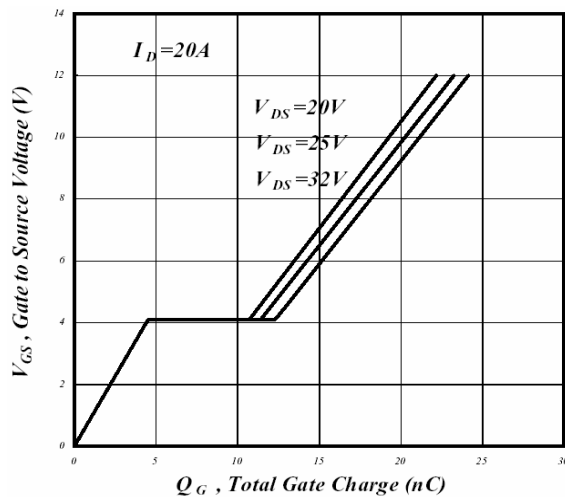
**Fig 4. Normalized On-Resistance v.s. Junction Temperature**



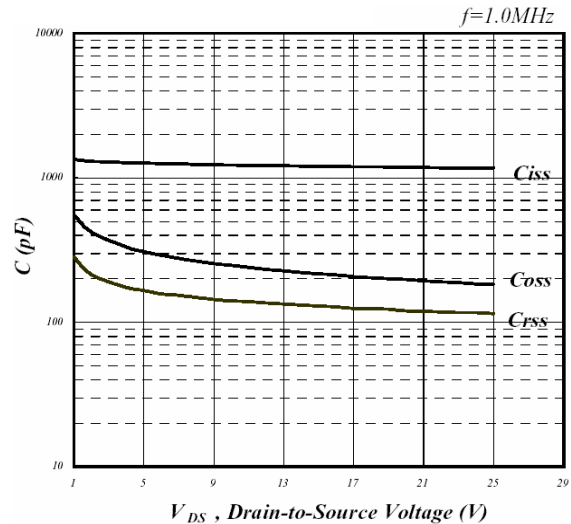
**Fig 5. Forward Characteristics of Reverse Diode**



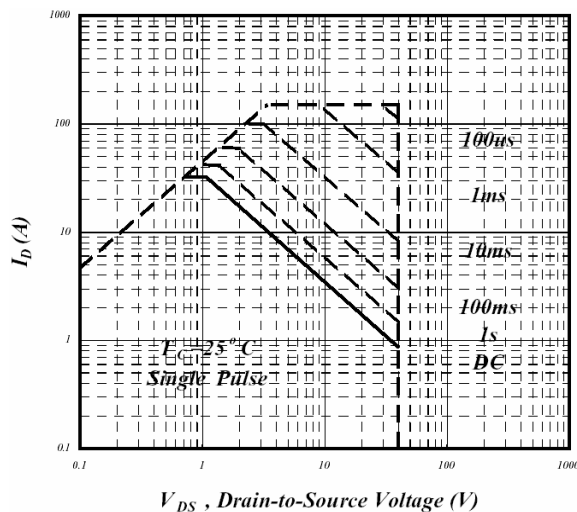
**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**



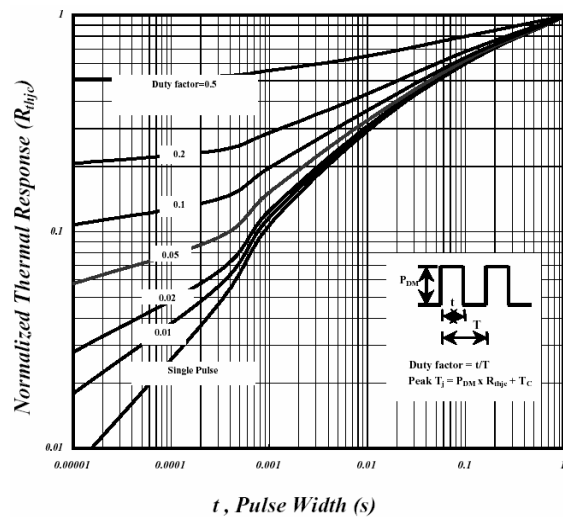
**Fig 7. Gate Charge Characteristics**



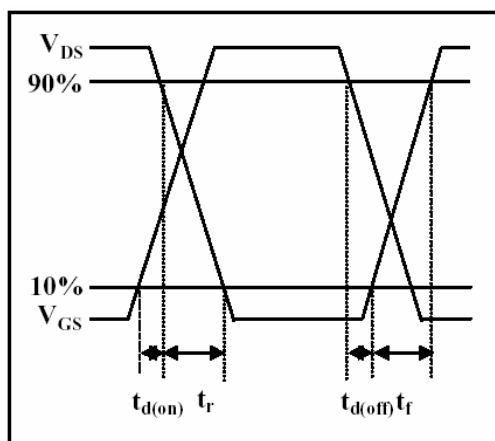
**Fig 8. Typical Capacitance Characteristics**



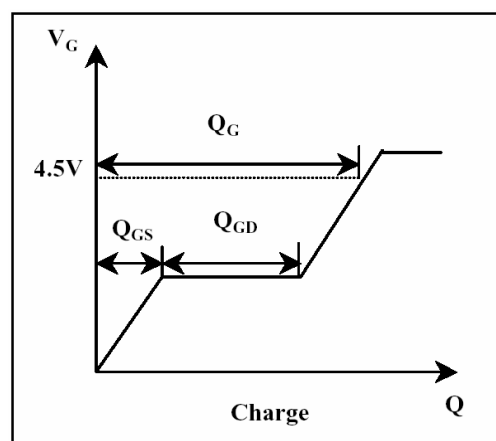
**Fig 9. Maximum Safe Operating Area**



**Fig 10. Effective Transient Thermal Impedance**



**Fig 11. Switching Time Waveform**



**Fig 12. Gate Charge Waveform**

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