

**GJ3403****P-CHANNEL ENHANCEMENT MODE POWER MOSFET**

|                     |       |
|---------------------|-------|
| BV <sub>DSS</sub>   | -30V  |
| R <sub>DS(ON)</sub> | 200mΩ |
| I <sub>D</sub>      | -10A  |

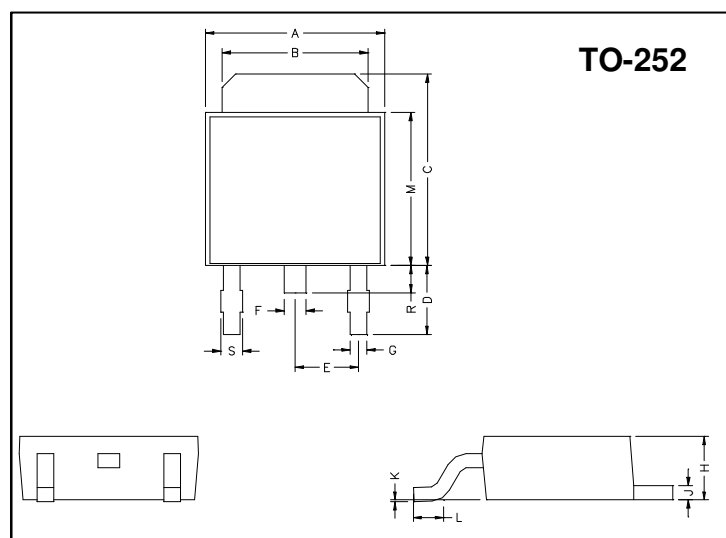
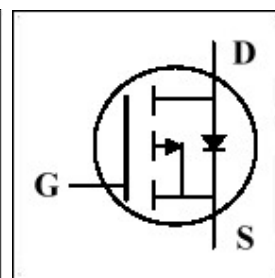
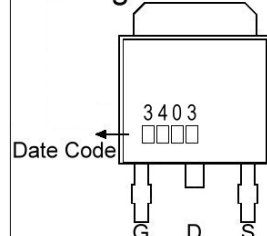
**Description**

The GJ3403 utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device.

The TO-252 package is universally used for commercial-industrial applications.

**Features**

- \*Simple Drive Requirement
- \*Lower Gate Charge
- \*Fast Switching

**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 <sub>DS</sub>                      | -30        | V    |
| Gate-Source Voltage                              | V <sub>GS</sub>                      | ±20        | V    |
| Continuous Drain Current                         | I <sub>D</sub> @T <sub>C</sub> =25°C | -10        | A    |
| Continuous Drain Current                         | I <sub>D</sub> @T <sub>C</sub> =70°C | -8.6       | A    |
| Pulsed Drain Current <sup>1</sup>                | I <sub>DM</sub>                      | -48        | A    |
| Total Power Dissipation                          | P <sub>D</sub> @T <sub>C</sub> =25°C | 36.7       | W    |
| Linear Derating Factor                           |                                      | 0.29       | W/°C |
| Operating Junction and Storage Temperature Range | T <sub>j</sub> , T <sub>stg</sub>    | -55 ~ +150 | °C   |

**Thermal Data**

| Parameter                                | Symbol                | Value | Unit |
|------------------------------------------|-----------------------|-------|------|
| Thermal Resistance Junction-case Max.    | R <sub>thj-case</sub> | 3.4   | °C/W |
| Thermal Resistance Junction-ambient Max. | R <sub>thj-amb</sub>  | 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>              | -30  | -    | -    | 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>                | -    | 2    | -    | S    | V <sub>DS</sub> =-10V, I <sub>D</sub> =-6A                                                                          |
| 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> =-30V, V <sub>GS</sub> =0                                                                           |
| Drain-Source Leakage Current(T <sub>j</sub> =150°C) |                                | -    | -    | -25  | uA   | V <sub>DS</sub> =-24V, V <sub>GS</sub> =0                                                                           |
| Static Drain-Source On-Resistance <sup>2</sup>      | R <sub>DS(ON)</sub>            | -    | -    | 200  | mΩ   | V <sub>GS</sub> =-10V, I <sub>D</sub> =-6A                                                                          |
|                                                     |                                | -    | -    | 400  |      | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4A                                                                         |
| Total Gate Charge <sup>2</sup>                      | Q <sub>g</sub>                 | -    | 3.8  | -    | nC   | I <sub>D</sub> =-6A<br>V <sub>DS</sub> =-24V<br>V <sub>GS</sub> =-4.5V                                              |
| Gate-Source Charge                                  | Q <sub>gs</sub>                | -    | 1.7  | -    |      |                                                                                                                     |
| Gate-Drain ("Miller") Charge                        | Q <sub>gd</sub>                | -    | 1.6  | -    |      |                                                                                                                     |
| Turn-on Delay Time <sup>2</sup>                     | T <sub>d(on)</sub>             | -    | 6.7  | -    | ns   | V <sub>DS</sub> =-15V<br>I <sub>D</sub> =-6A<br>V <sub>GS</sub> =-10V<br>R <sub>G</sub> =2Ω<br>R <sub>D</sub> =2.5Ω |
| Rise Time                                           | T <sub>r</sub>                 | -    | 20.8 | -    |      |                                                                                                                     |
| Turn-off Delay Time                                 | T <sub>d(off)</sub>            | -    | 14.9 | -    |      |                                                                                                                     |
| Fall Time                                           | T <sub>f</sub>                 | -    | 4.4  | -    |      |                                                                                                                     |
| Input Capacitance                                   | C <sub>iss</sub>               | -    | 217  | -    | pF   | V <sub>GS</sub> =0V<br>V <sub>DS</sub> =-25V<br>f=1.0MHz                                                            |
| Output Capacitance                                  | C <sub>oss</sub>               | -    | 103  | -    |      |                                                                                                                     |
| Reverse Transfer Capacitance                        | C <sub>rss</sub>               | -    | 31   | -    |      |                                                                                                                     |

**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> =-1.25A, V <sub>GS</sub> =0V               |
| Reverse Recovery Time           | T <sub>rr</sub> | -    | 35   | -    | ns   | I <sub>S</sub> =-6A, V <sub>GS</sub> =0V<br>dI/dt=100A/μs |
| Reverse Recovery Charge         | Q <sub>rr</sub> | -    | 63   | -    | nC   |                                                           |

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

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

## Characteristics Curve

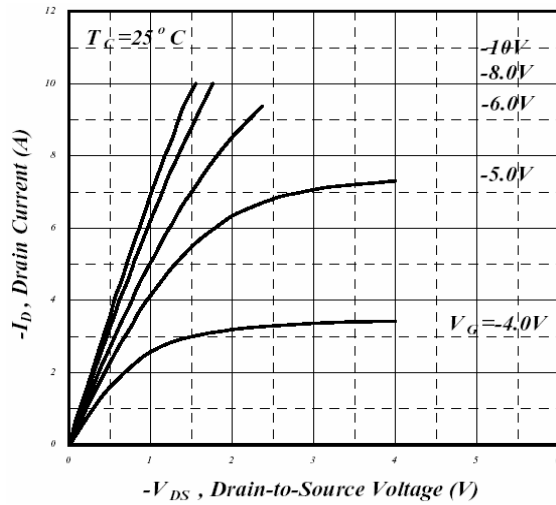


Fig 1. Typical Output Characteristics

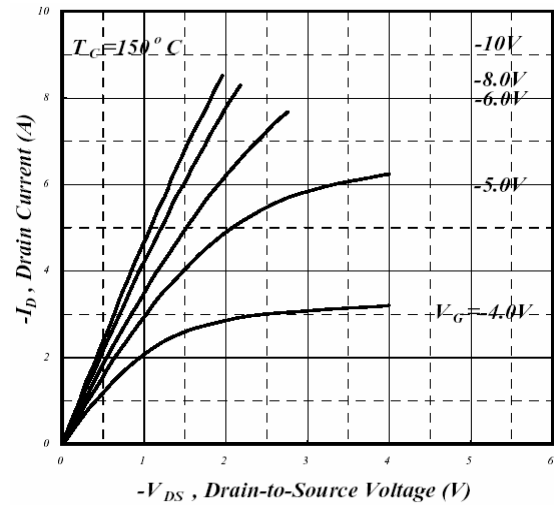


Fig 2. Typical Output Characteristics

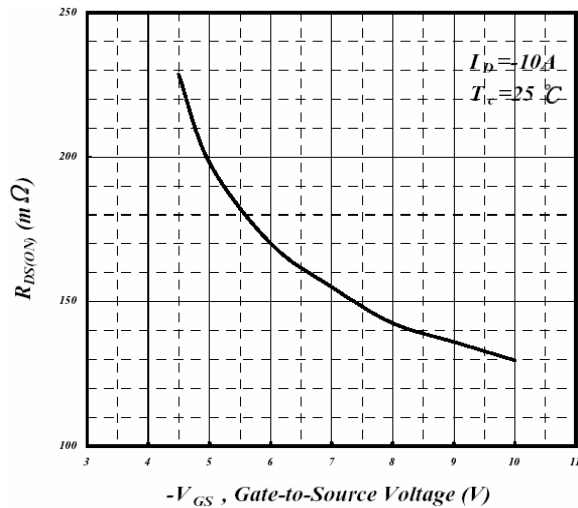


Fig 3. On-Resistance v.s. Gate Voltage

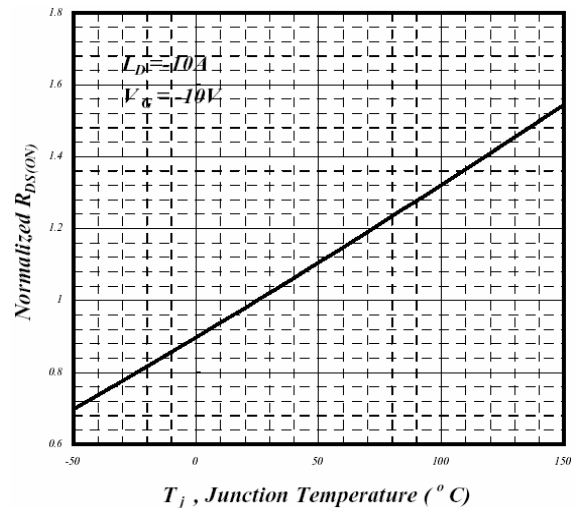


Fig 4. Normalized On-Resistance v.s. Junction Temperature

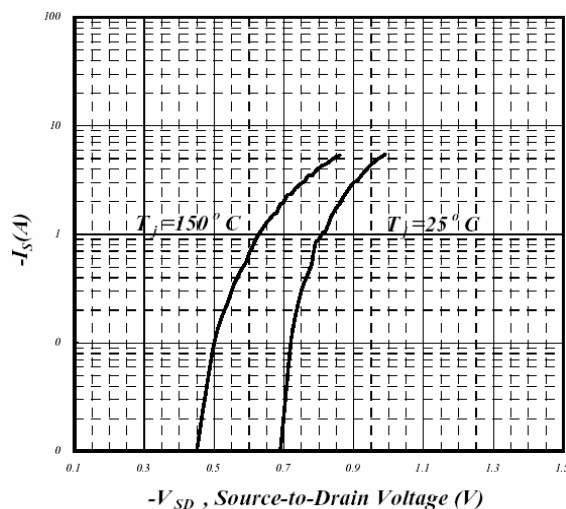


Fig 5. Forward Characteristics of Reverse Diode

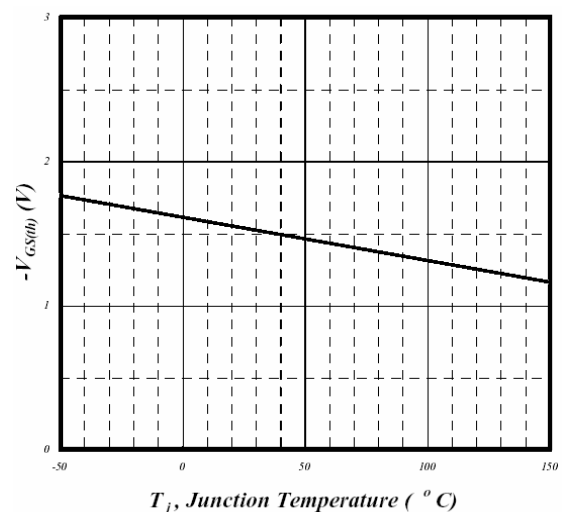
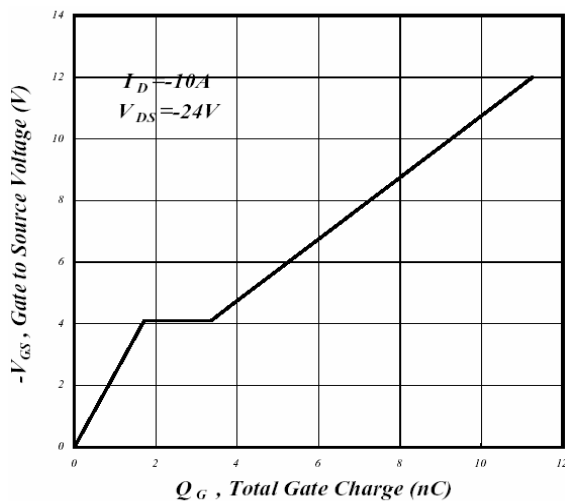
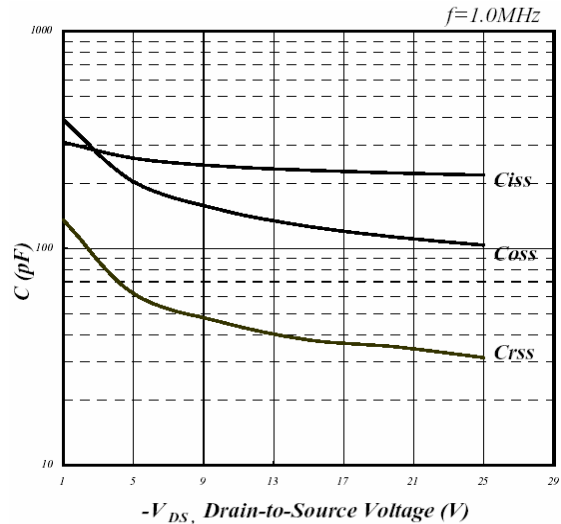


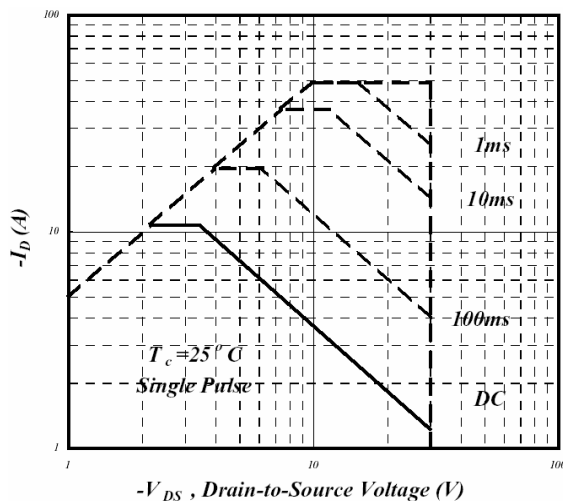
Fig 6. Gate Threshold Voltage v.s. Junction Temperature



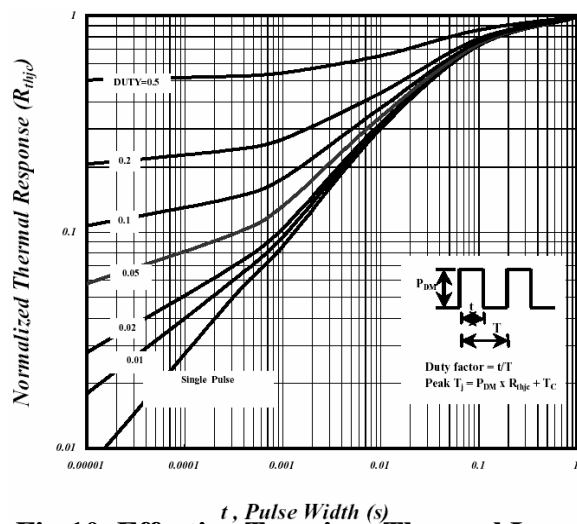
**Fig 7. Gate Charge Characteristics**



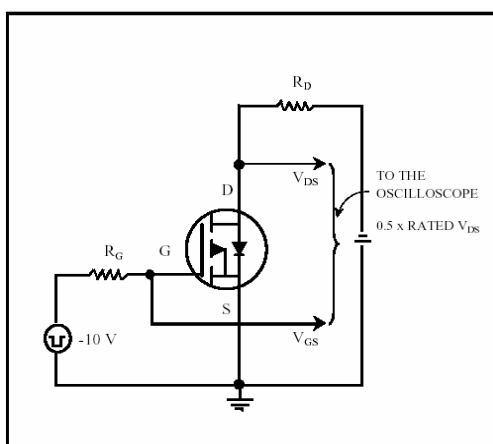
**Fig 8. Typical Capacitance Characteristics**



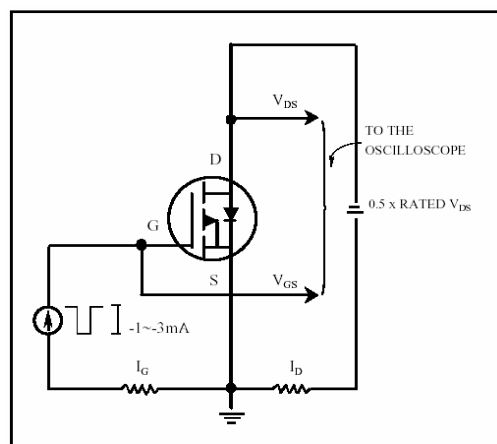
**Fig 9. Maximum Safe Operating Area**



**Fig 10. Effective Transient Thermal Impedance**



**Fig 11. Switching Time Circuit**



**Fig 12. Gate Charge Circuit**

**Important Notice:**

- All rights are reserved. Reproduction in whole or in part is prohibited without the prior written approval of GTM.
- GTM reserves the right to make changes to its products without notice.
- GTM semiconductor products are not warranted to be suitable for use in life-support Applications, or systems.
- GTM assumes no liability for any consequence of customer product design, infringement of patents, or application assistance.

**Head Office And Factory:**

- **Taiwan:** No. 17-1 Tatung Rd. Fu Kou Hsin-Chu Industrial Park, Hsin-Chu, Taiwan, R. O. C.  
TEL : 886-3-597-7061 FAX : 886-3-597-9220, 597-0785
- **China:** (201203) No.255, Jang-Jiang Tsai-Lueng RD. , Pu-Dung-Hsin District, Shang-Hai City, China  
TEL : 86-21-5895-7671 ~ 4 FAX : 86-21-38950165