

**G2N7002K****N-CHANNEL ENHANCEMENT MODE POWER MOSFET**

|                     |       |
|---------------------|-------|
| BV <sub>DSS</sub>   | 60V   |
| R <sub>DS(ON)</sub> | 2Ω    |
| I <sub>D</sub>      | 640mA |

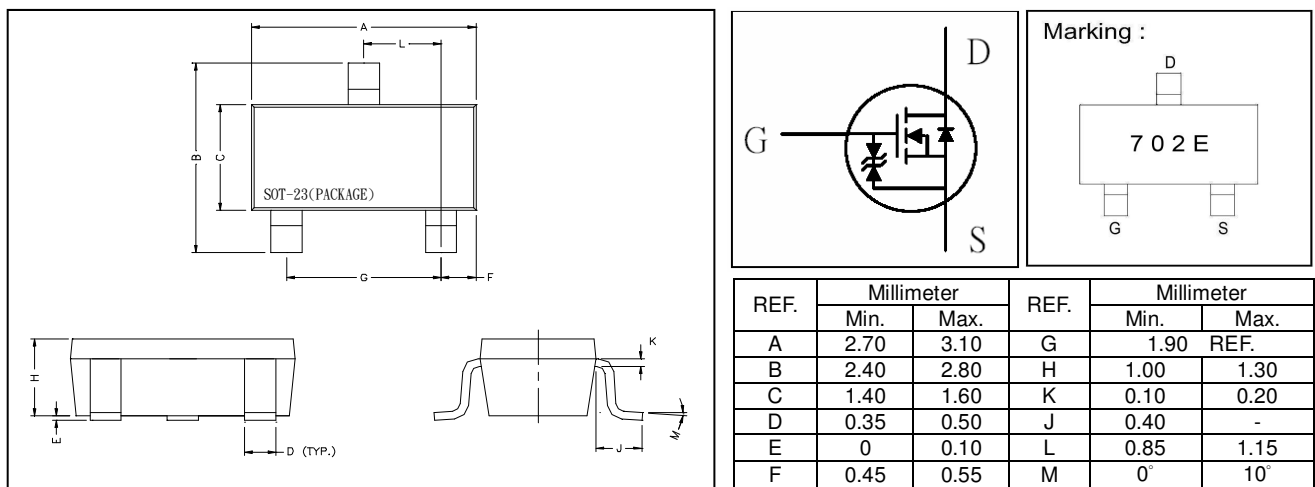
**Description**

The G2N7002K utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device.

The G2N7002K is universally used for all commercial-industrial applications.

**Features**

- \*Simple Drive Requirement
- \*Small Package Outline
- \*RoHS Compliant

**Package Dimensions****Absolute Maximum Ratings**

| Parameter                                                    | Symbol                            | Ratings    | Unit |
|--------------------------------------------------------------|-----------------------------------|------------|------|
| Drain-Source Voltage                                         | V <sub>DS</sub>                   | 60         | V    |
| Gate-Source Voltage                                          | V <sub>GS</sub>                   | ±20        | V    |
| Continuous Drain Current <sup>3</sup> , V <sub>GS</sub> @10V | I <sub>D</sub> @TA=25°C           | 640        | mA   |
| Continuous Drain Current <sup>3</sup> , V <sub>GS</sub> @10V | I <sub>D</sub> @TA=70°C           | 500        | mA   |
| Pulsed Drain Current <sup>1,2</sup>                          | I <sub>DM</sub>                   | 950        | mA   |
| Power Dissipation                                            | P <sub>D</sub> @TA=25°C           | 1.38       | W    |
| Linear Derating Factor                                       |                                   | 0.01       | W/°C |
| Operating Junction and Storage Temperature Range             | T <sub>j</sub> , T <sub>stg</sub> | -55 ~ +150 | °C   |

**Thermal Data**

| Parameter                                             | Symbol             | Ratings | Unit |
|-------------------------------------------------------|--------------------|---------|------|
| Thermal Resistance Junction-ambient <sup>3</sup> Max. | R <sub>thj-a</sub> | 90      | °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>              | 60   | -    | -    | V    | V <sub>GS</sub> =0, I <sub>D</sub> =250uA                                                                            |
| Breakdown Voltage Temperature Coefficient          | $\Delta BV_{DSS} / \Delta T_j$ | -    | 0.06 | -    | 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>                | -    | 600  | -    | mS   | V <sub>DS</sub> =10V, I <sub>D</sub> =600mA                                                                          |
| Gate-Source Leakage Current                        | I <sub>GSS</sub>               | -    | -    | ±10  | uA   | 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> =60V, V <sub>GS</sub> =0                                                                             |
| Drain-Source Leakage Current(T <sub>j</sub> =70°C) |                                | -    | -    | 100  | uA   | V <sub>DS</sub> =48V, V <sub>GS</sub> =0                                                                             |
| Static Drain-Source On-Resistance                  | R <sub>DS(ON)</sub>            | -    | -    | 2    | Ω    | V <sub>GS</sub> =10V, I <sub>D</sub> =500mA                                                                          |
|                                                    |                                | -    | -    | 4    |      | V <sub>GS</sub> =4.5V, I <sub>D</sub> =200mA                                                                         |
| Total Gate Charge <sup>2</sup>                     | Q <sub>g</sub>                 | -    | 1    | 1.6  | nC   | I <sub>D</sub> =600mA<br>V <sub>DS</sub> =50V<br>V <sub>GS</sub> =4.5V                                               |
| Gate-Source Charge                                 | Q <sub>gs</sub>                | -    | 0.5  | -    |      |                                                                                                                      |
| Gate-Drain ("Miller") Charge                       | Q <sub>gd</sub>                | -    | 0.5  | -    |      |                                                                                                                      |
| Turn-on Delay Time <sup>2</sup>                    | T <sub>d(on)</sub>             | -    | 12   | -    | ns   | V <sub>DS</sub> =30V<br>I <sub>D</sub> =600mA<br>V <sub>GS</sub> =10V<br>R <sub>G</sub> =3.3Ω<br>R <sub>D</sub> =52Ω |
| Rise Time                                          | T <sub>r</sub>                 | -    | 10   | -    |      |                                                                                                                      |
| Turn-off Delay Time                                | T <sub>d(off)</sub>            | -    | 56   | -    |      |                                                                                                                      |
| Fall Time                                          | T <sub>f</sub>                 | -    | 29   | -    |      |                                                                                                                      |
| Input Capacitance                                  | C <sub>iss</sub>               | -    | 32   | 50   | pF   | V <sub>GS</sub> =0V<br>V <sub>DS</sub> =25V<br>f=1.0MHz                                                              |
| Output Capacitance                                 | C <sub>oss</sub>               | -    | 8    | -    |      |                                                                                                                      |
| Reverse Transfer Capacitance                       | C <sub>rss</sub>               | -    | 6    | -    |      |                                                                                                                      |

**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> =200mA, V <sub>GS</sub> =0V |

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

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

3. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board; 270°C/W when mounted on Min. copper pad.

## Characteristics Curve

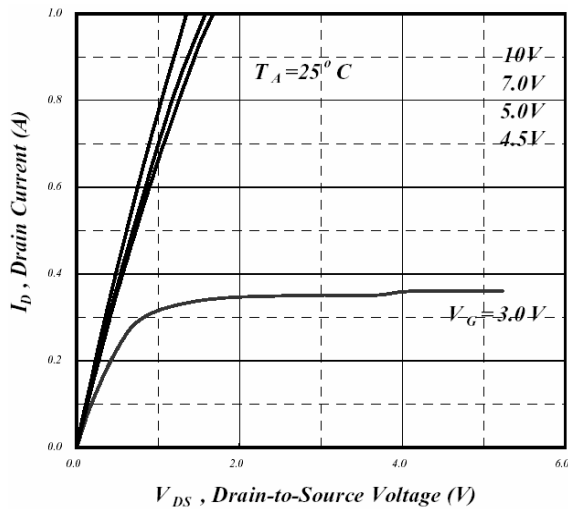


Fig 1. Typical Output Characteristics

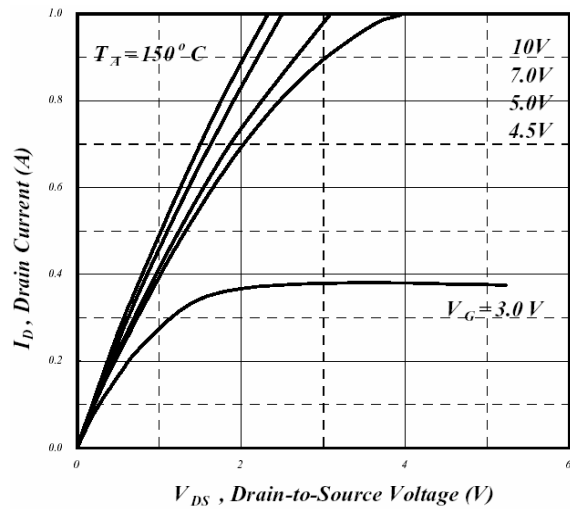


Fig 2. Typical Output Characteristics

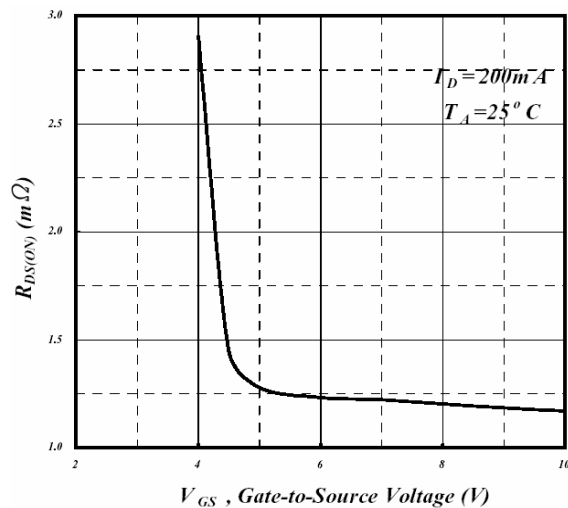


Fig 3. On-Resistance v.s. Gate Voltage

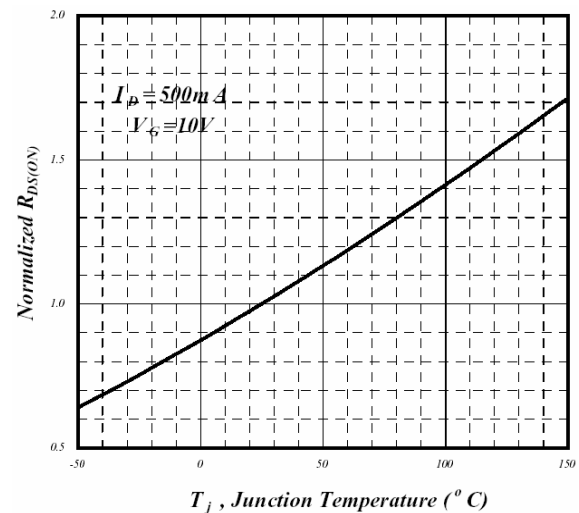


Fig 4. Normalized On-Resistance v.s. Junction Temperature

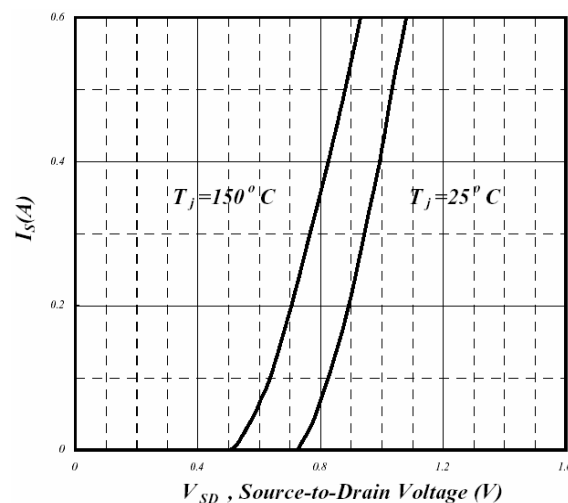


Fig 5. Forward Characteristics of Reverse Diode

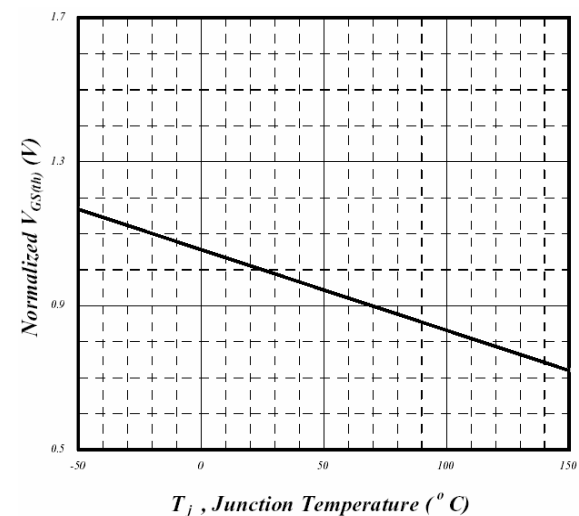


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

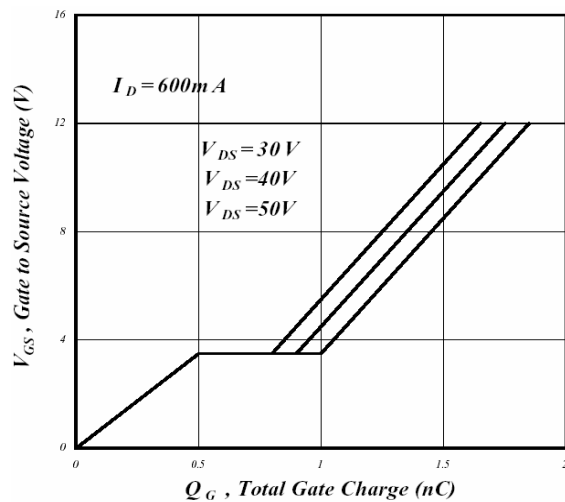


**Fig 7. Gate Charge Characteristics**

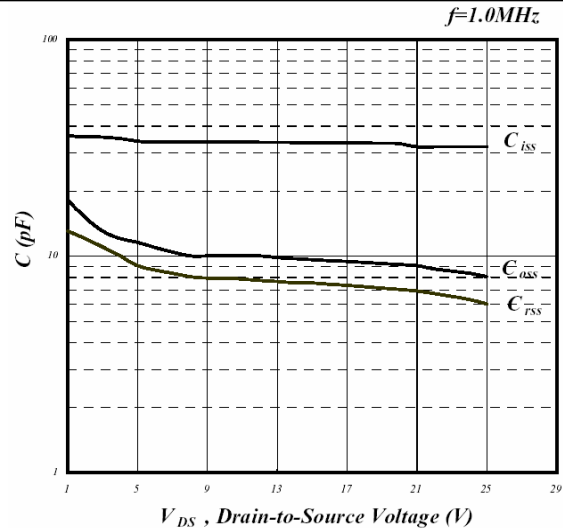


**Fig 8. Typical Capacitance Characteristics**

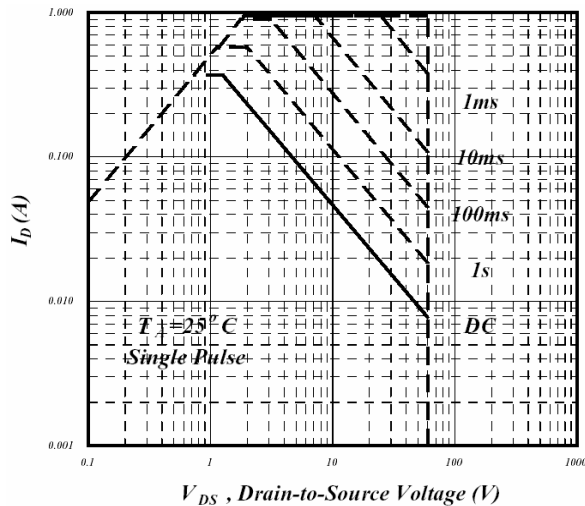


**Fig 9. Maximum Safe Operating Area**

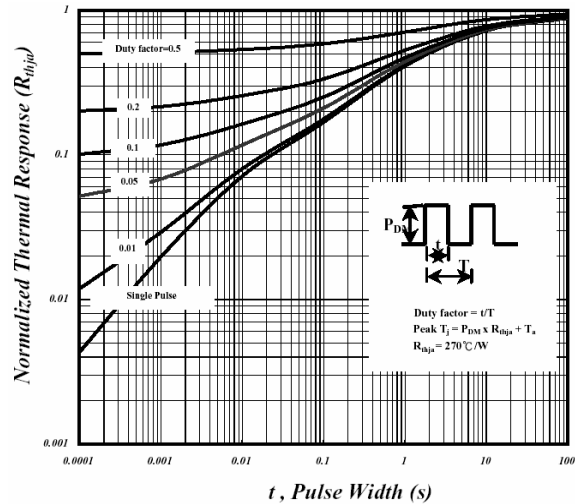


**Fig 10. Effective Transient Thermal Impedance**

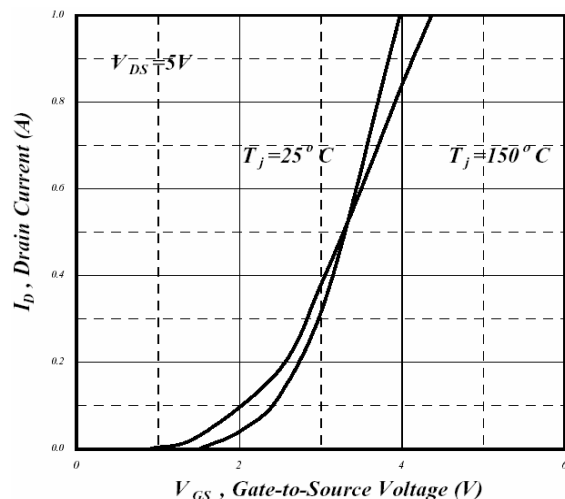


**Fig 11. Transfer Characteristics**

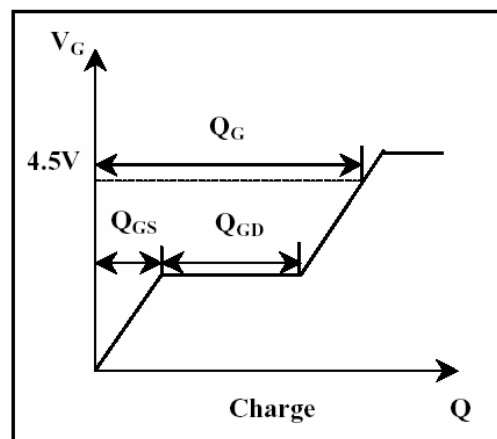


**Fig 12. Gate Charge Waveform**

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