

G6402

P-CHANNEL ENHANCEMENT MODE POWER MOSFET

| | |
|---------|-------|
| BVDSS | -20V |
| RDS(ON) | 65mΩ |
| ID | -4.2A |

Description

The G6402 provides the designer with the best combination of fast switching, low on-resistance and cost-effectiveness.

The G6402 is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

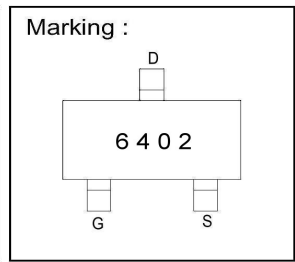
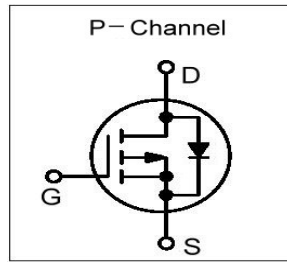
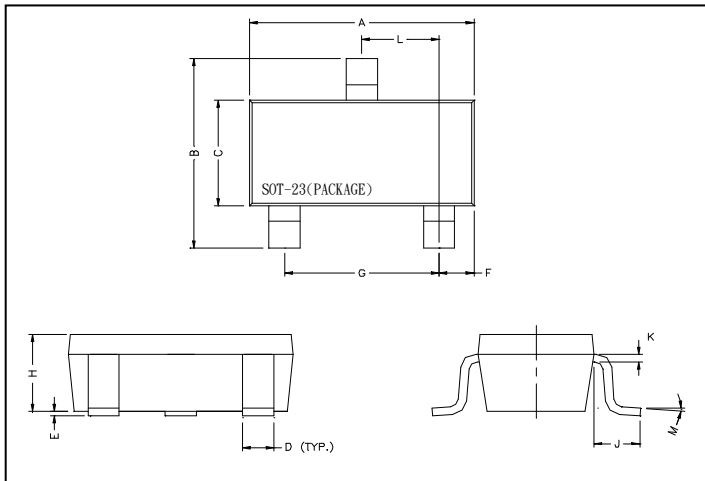
Features

- Ultra Low R_{DS(ON)}
- Fast Switching

Applications

- Power Management in Notebook Computer
- Portable Equipment
- Battery Powered System.

Package Dimensions



| REF. | Millimeter | | REF. | Millimeter | |
|------|------------|------|------|------------|------|
| | Min. | Max. | | Min. | Max. |
| A | 2.70 | 3.10 | G | 1.90 | REF. |
| B | 2.40 | 2.80 | H | 1.00 | 1.30 |
| C | 1.40 | 1.60 | K | 0.10 | 0.20 |
| D | 0.35 | 0.50 | J | 0.40 | - |
| E | 0 | 0.10 | L | 0.85 | 1.15 |
| F | 0.45 | 0.55 | M | 0 | 10 |

Absolute Maximum Ratings

| Parameter | Symbol | Ratings | Unit |
|--|-----------------------------------|------------|------|
| Drain-Source Voltage | V _{DS} | -20 | V |
| Gate-Source Voltage | V _{GS} | ±12 | V |
| Continuous Drain Current ³ | I _D @TA=25°C | -4.2 | A |
| Continuous Drain Current ³ | I _D @TA=70°C | -3.4 | A |
| Pulsed Drain Current ^{1,2} | I _{DM} | -10 | A |
| Power Dissipation | P _D @TA=25°C | 1.38 | W |
| Linear Derating Factor | | 0.01 | W/°C |
| Operating Junction and Storage Temperature Range | T _j , T _{stg} | -55 ~ +150 | °C |

Thermal Data

| Parameter | Symbol | Ratings | Unit |
|---|--------------------|---------|------|
| Thermal Resistance Junction-ambient ³ Max. | R _{thj-a} | 90 | °C/W |

Electrical Characteristics(T_j = 25°C Unless otherwise specified)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|--|-------------------------------------|------|------|------|------|--|
| Drain-Source Breakdown Voltage | BV _{DSS} | -20 | - | - | V | V _{GS} =0, I _D =-250uA |
| Breakdown Voltage Temperature Coefficient | ΔBV _{DSS} /ΔT _j | - | -0.1 | - | V/°C | Reference to 25°C, I _D =-1mA |
| Gate Threshold Voltage | V _{GS(th)} | -0.5 | - | - | V | V _{DS} = V _{GS} , I _D =-250uA |
| Forward Transconductance | g _{fs} | - | 9 | - | S | V _{DS} =-5.0V, I _D =-2.8A |
| Gate-Source Leakage Current | I _{GSS} | - | - | ±100 | nA | V _{GS} = ±12V |
| Drain-Source Leakage Current(T _j =25°C) | I _{DSS} | - | - | -1 | uA | V _{DS} =-20V, V _{GS} =0 |
| Drain-Source Leakage Current(T _j =70°C) | | - | - | -10 | uA | V _{DS} =-16V, V _{GS} =0 |
| Static Drain-Source On-Resistance ² | R _{DS(ON)} | - | - | 65 | mΩ | V _{GS} =-4.5V, I _D =-3.7A |
| | | - | - | 135 | | V _{GS} =-2.5V, I _D =-3.1A |
| Total Gate Charge ² | Q _g | - | 10.6 | - | nC | I _D =-4.2A |
| Gate-Source Charge | Q _{gs} | - | 2.32 | - | | V _{DS} =-16V |
| Gate-Drain ("Miller") Change | Q _{gd} | - | 3.68 | - | | V _{GS} =-4.5V |
| Turn-on Delay Time ² | T _{d(on)} | - | 5.9 | - | ns | V _{DS} =-15V I _D =-4.2A, V _{GS} =-10V R _G =6Ω R _D =3.6Ω |
| Rise Time | T _r | - | 3.6 | - | | |
| Turn-off Delay Time | T _{d(off)} | - | 32.4 | - | | |
| Fall Time | T _f | - | 2.6 | - | | |
| Input Capacitance | C _{iss} | - | 740 | - | pF | V _{GS} =0V V _{DS} =-15V f=1.0MHz |
| Output Capacitance | C _{oss} | - | 167 | - | | |
| Reverse Transfer Capacitance | C _{rss} | - | 126 | - | | |

Source-Drain Diode

| | | | | | | |
|---------------------------------|-----------------|---|------|------|----|--|
| Forward On Voltage ² | V _{SD} | - | - | -1.2 | V | I _S =-1.2A, V _{GS} =0 T _j =25°C |
| Reverse Recovery Time | T _{rr} | - | 27.7 | - | ns | I _S =-4.2A, V _{GS} =0 |
| Reverse Recovery Charge | Q _{rr} | - | 22 | - | nC | di/dt=100A/μs |

Notes: 1. Pulse width limited by Max. junction temperature.
2. Pulse width ≤ 300us, duty cycle ≤ 2%.
3. Surface mounted on 1 in² copper pad of FR4 board;270°C/w when mounted on min. copper pad.

Characteristics Curve

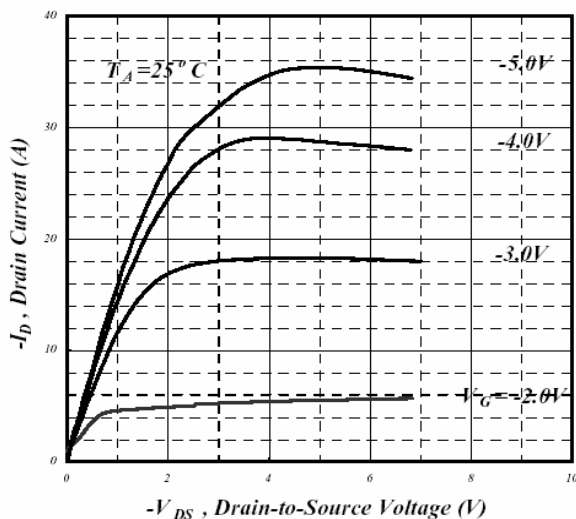


Fig 1. Typical Output Characteristics

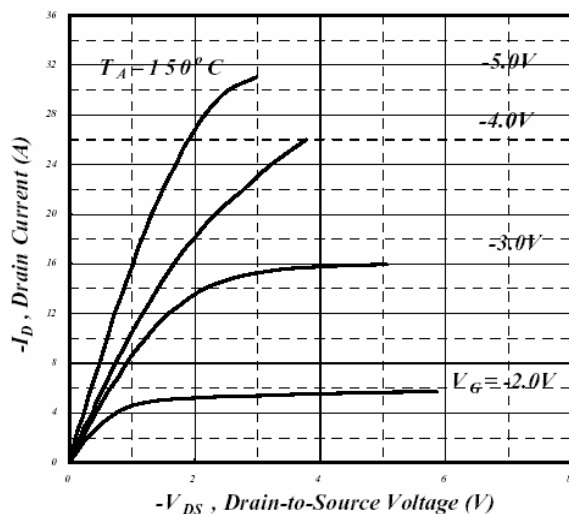


Fig 2. Typical Output Characteristics

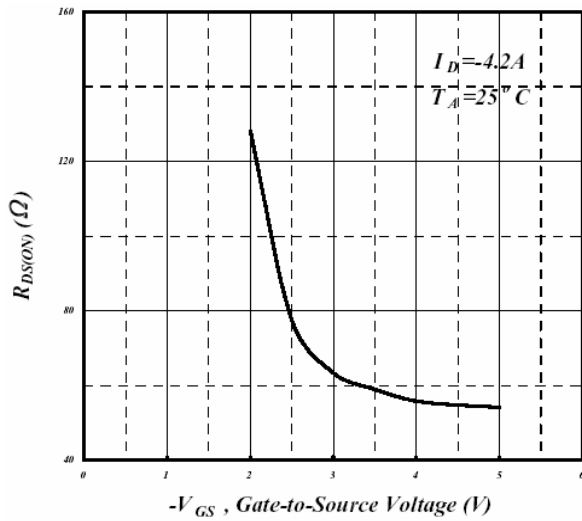


Fig 3. On-Resistance v.s. Gate Voltage

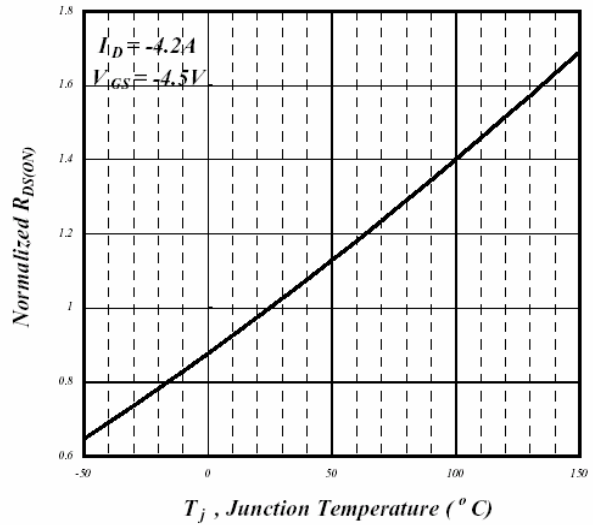


Fig 4. Normalized On-Resistance v.s. Junction Temperature

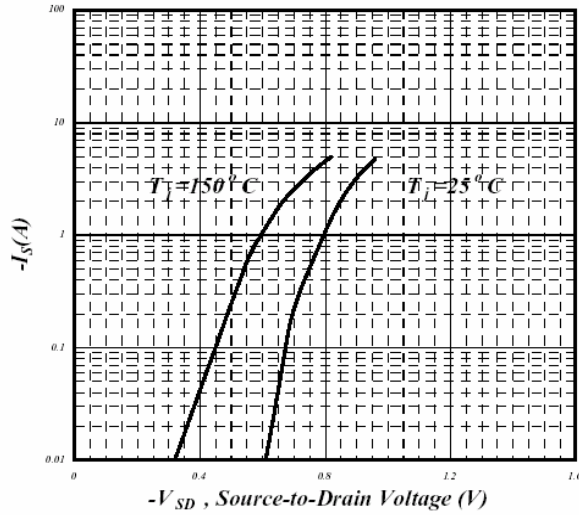


Fig 5. Forward Characteristic of Reverse Diode

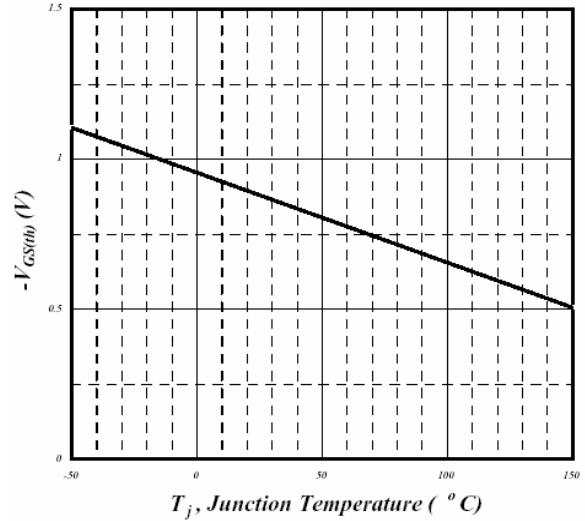


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

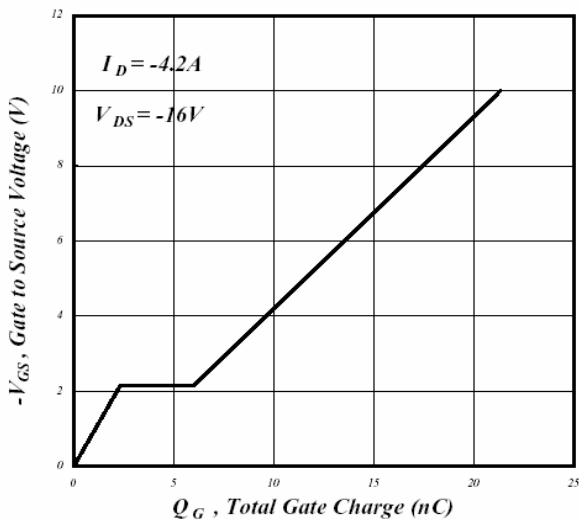


Fig 7. Gate Charge Characteristics

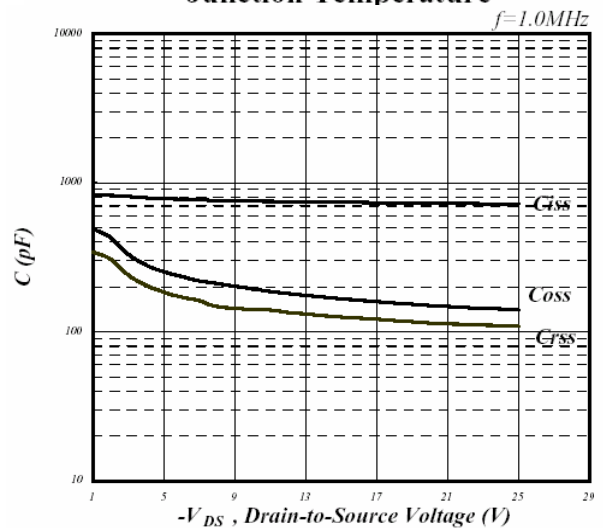


Fig 8. Typical Capacitance Characteristics

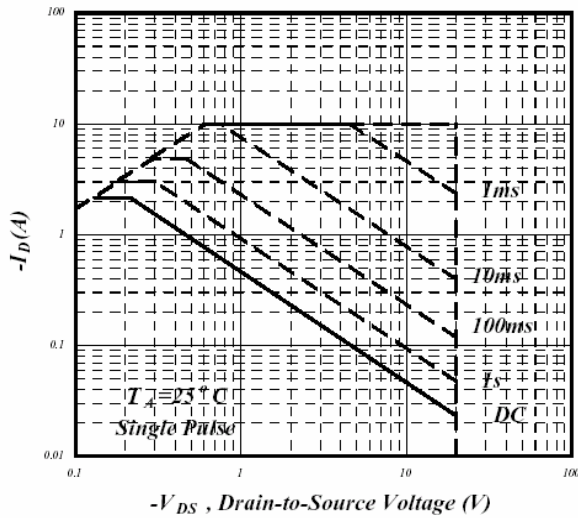


Fig 9. Maximum Safe Operating Area

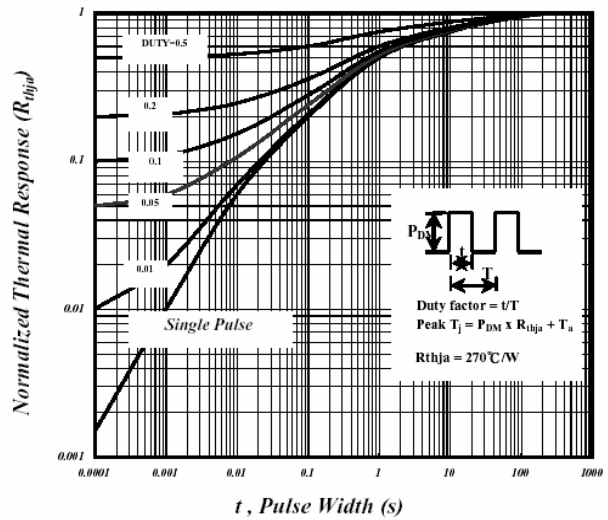


Fig 10. Effective Transient Thermal Impedance

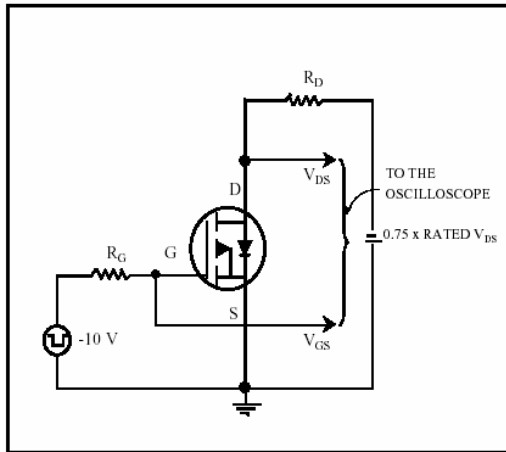


Fig 11. Switching Time Circuit

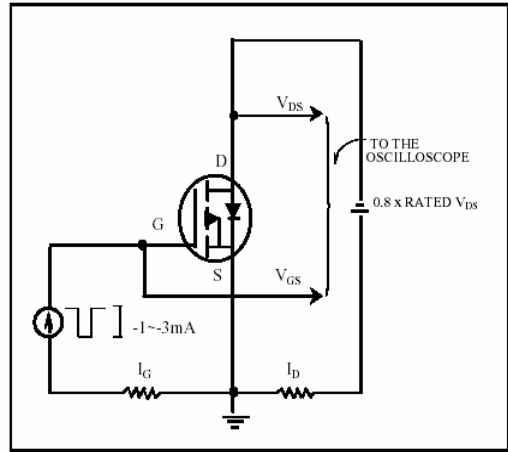


Fig 12. Gate Charge Circuit

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