

STT2602

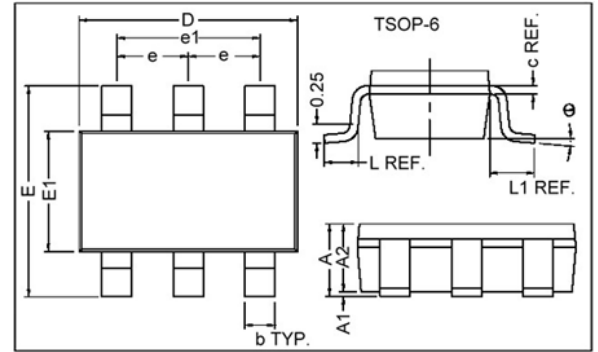
6.3 A, 20V, R_{DS(ON)} 34mΩ

N-Channel Enhancement Mode Power Mos.FET

RoHS Compliant Product

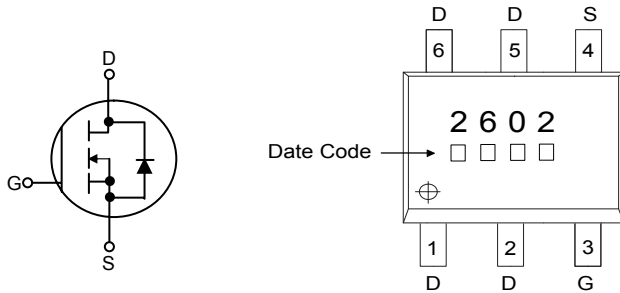
Description

The STT2602 utilized advance processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device. The STT2602 is universally used for all commercial-industrial applications.



Features

- * Low On-Resistance
- * Capable of 2.5V Gate Drive



| REF. | Millimeter | | REF. | Millimeter | |
|------|------------|------|------|------------|------|
| | Min. | Max. | | Min. | Max. |
| A | 1.10 MAX. | | L | 0.45 REF. | |
| A1 | 0 | 0.10 | L1 | 0.60 REF. | |
| A2 | 0.70 | 1.00 | □ | 0° | 10° |
| c | 0.12 REF. | | b | 0.30 | 0.50 |
| D | 2.70 | 3.10 | e | 0.95 REF. | |
| E | 2.60 | 3.00 | e1 | 1.90 REF. | |
| E1 | 1.40 | 1.80 | | | |

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 , V _{GS} @4.5V | I _b @T _c =25°C | 6.3 | A |
| Continuous Drain Current ³ , V _{GS} @4.5V | I _b @T _c =70°C | 5 | A |
| Pulsed Drain Current ^{1,2} | I _{bm} | 30 | A |
| Total Power Dissipation | P _D @T _c =25°C | 2 | W |
| Linear Derating Factor | | 0.016 | W/°C |
| Operating Junction and Storage Temperature Range | T _j , T _{stg} | -55~+150 | °C |

Thermal Data

| Parameter | Symbol | Ratings | Unit |
|---|--------------------|---------|------|
| Thermal Resistance Junction-case ³ | R _{thj-c} | 62.5 | °C/W |

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

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Condition |
|---|-------------------------------------|------|------|------|------|---|
| Drain-Source Breakdown Voltage | BV _{DSS} | 20 | - | - | V | V _{GS} =0V, I _D =250uA |
| Breakdown Voltage Temp. 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 |
| 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 =55°C) | | - | - | 10 | uA | V _{DS} =16V, V _{GS} =0 |
| Static Drain-Source On-Resistance ² | R _{DS(ON)} | - | - | 30 | mΩ | V _{GS} =10V, I _D =5.5A |
| | | - | - | 34 | | V _{GS} =4.5V, I _D =5.3A |
| | | - | - | 50 | | V _{GS} =2.5V, I _D =2.6A |
| | | - | - | 90 | | V _{GS} =1.8V, I _D =1.0A |
| Total Gate Charge ² | Q _g | - | 8.7 | 16 | nC | I _D =5.3A V _{DS} =10V V _{GS} =4.5V |
| Gate-Source Charge | Q _{gs} | - | 1.5 | - | | |
| Gate-Drain ("Miller") Charge | Q _{gd} | - | 3.6 | - | | |
| Turn-on Delay Time ² | T _{d(ON)} | - | 6 | - | nS | V _{DD} =15V I _D =1A V _{GS} =10V R _G =2Ω R _D =15Ω |
| Rise Time | T _r | - | 14 | - | | |
| Turn-off Delay Time | T _{d(OFF)} | - | 18.4 | - | | |
| Fall Time | T _f | - | 2.8 | - | | |
| Input Capacitance | C _{iss} | - | 603 | 1085 | pF | V _{GS} =0V V _{DS} =15V f=1.0MHz |
| Output Capacitance | C _{oss} | - | 144 | - | | |
| Reverse Transfer Capacitance | C _{rss} | - | 111 | - | | |
| Forward Transconductance | G _{fs} | - | 13 | - | S | V _{DS} =5V, I _D =5.3A |

Source-Drain Diode

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Condition |
|------------------------------------|-----------------|------|------|------|------|---|
| Forward On Voltage ² | V _{SD} | - | - | 1.2 | V | I _S =1.2A, V _{GS} =0V. |
| Reverse Recovery Time ² | T _{rr} | - | 16.8 | - | nS | I _S =5A, V _{GS} =0V. dI/dt=100A/us |
| Reverse Recovery Charge | Q _{rr} | - | 11 | - | nC | |

Notes: 1.Pulse width limited by safe operating area.

2.Pulse width ≤300us, dutycycle ≤2%.

3.Surface mounted on 1 in² copper pad of FR4 board; 156°C/W when mounted on Min. copper pad.

Characteristics Curve

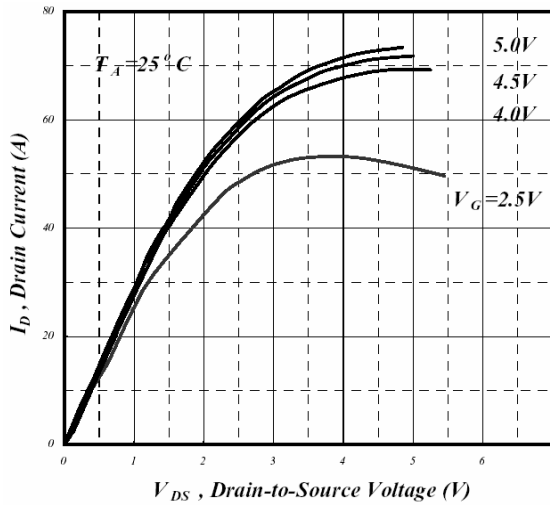


Fig 1. Typical Output Characteristics

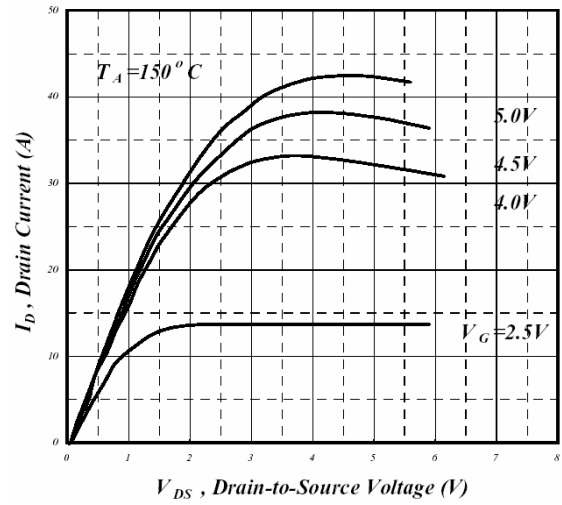


Fig 2. Typical Output Characteristics

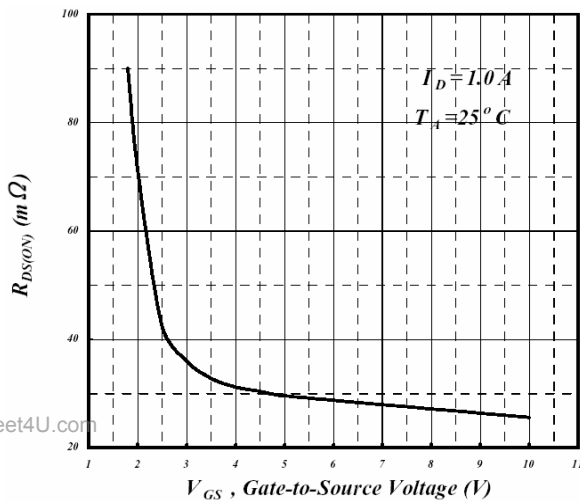


Fig 3. On-Resistance v.s. Gate Voltage

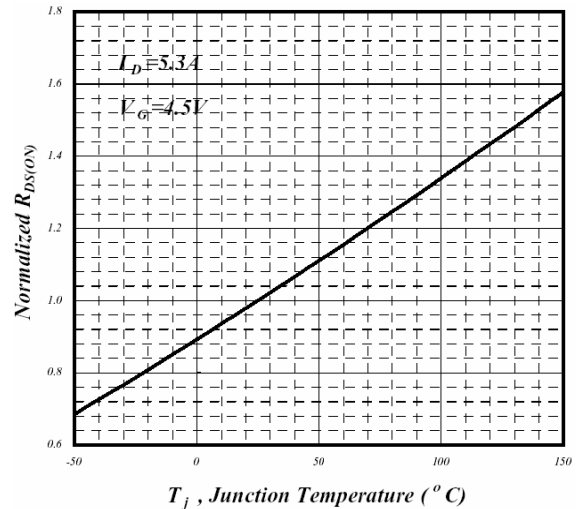


Fig 4. Normalized On-Resistance v.s. Junction Temperature

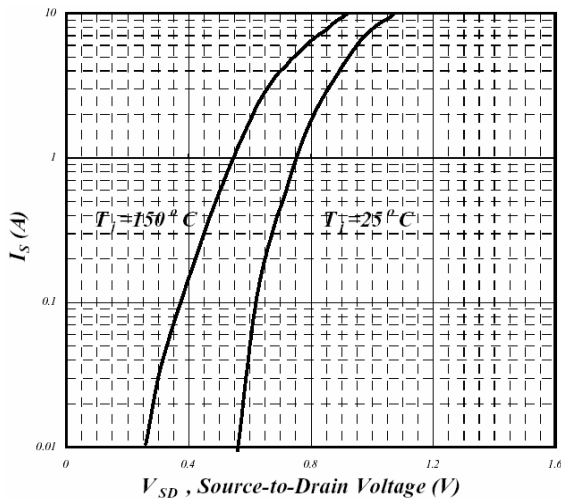


Fig 5. Forward Characteristics of Reverse Diode

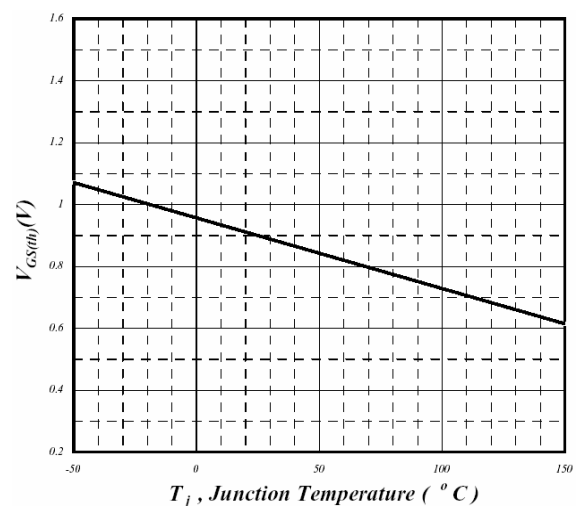


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

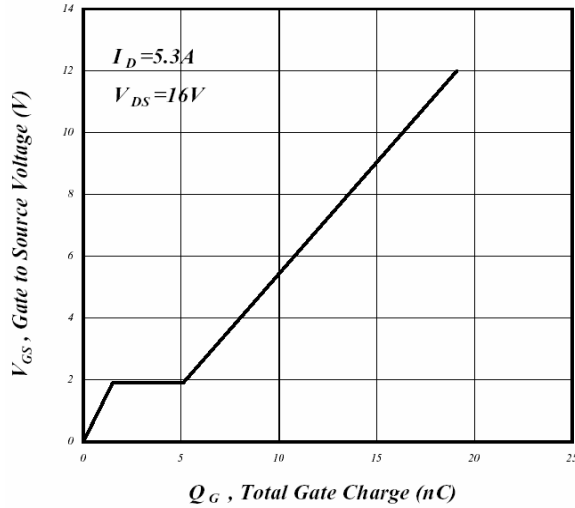


Fig 7. Gate Charge Characteristics

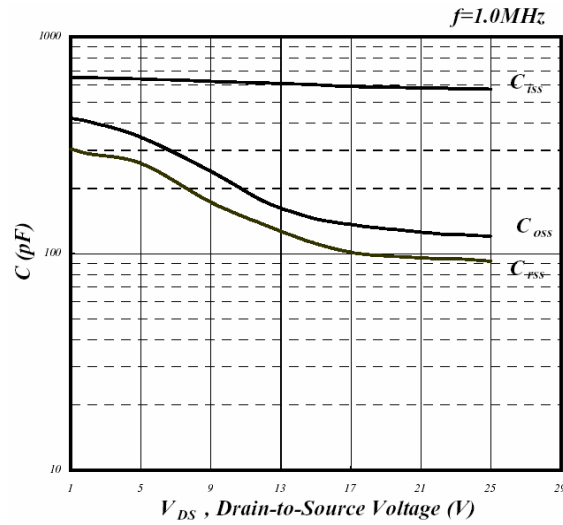


Fig 8. Typical Capacitance Characteristics

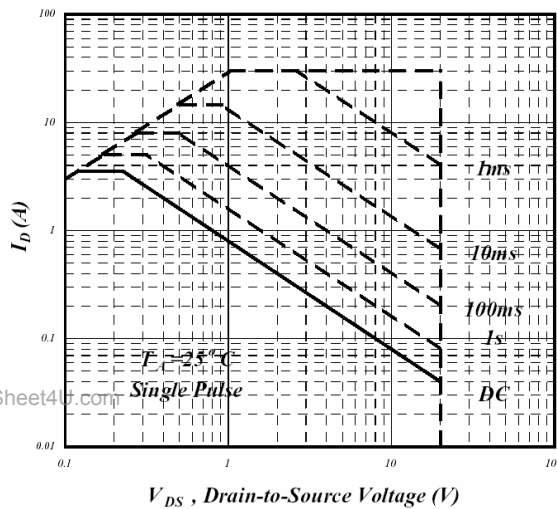


Fig 9. Maximum Safe Operating Area

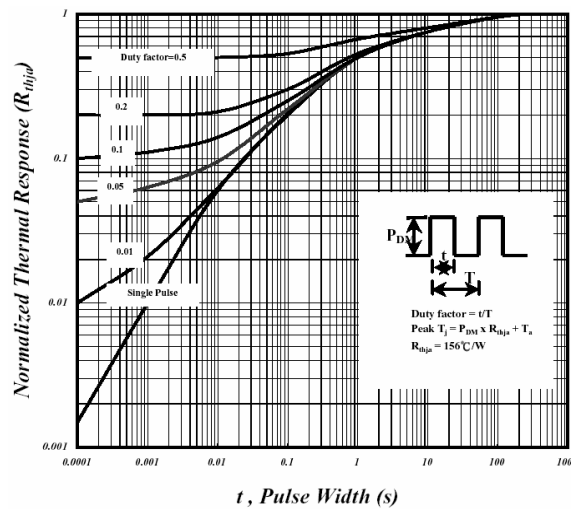


Fig 10. Effective Transient Thermal Impedance

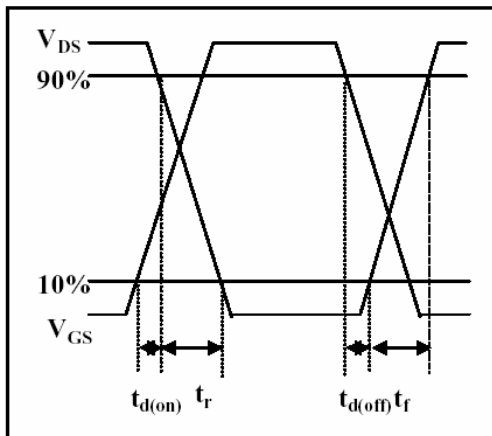


Fig 11. Switching Time Waveform

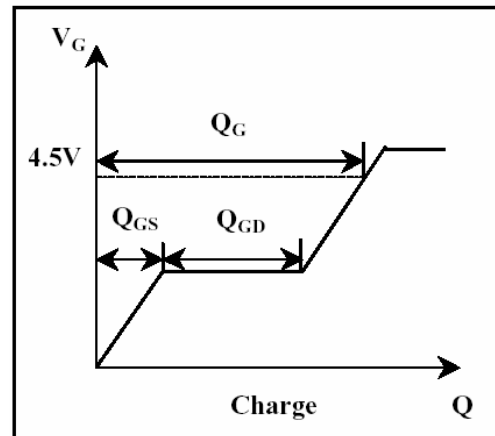


Fig 12. Gate Charge Waveform