

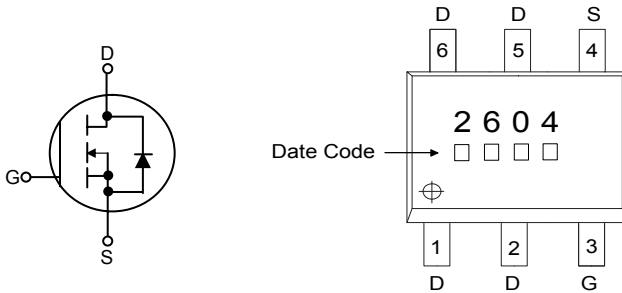
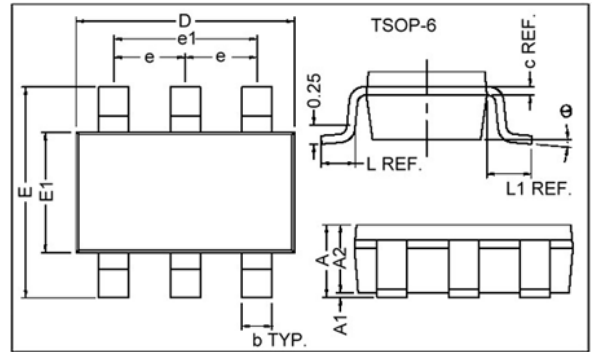
RoHS Compliant Product

## Description

The STT2604 utilized advance processing techniques to achieve the lowest possible on-resistance, extremly efficient and cost-effectiveness device. The STT2604 is universally used for all commercial-industrial applications.

## Features

- \* Lower Gate Charge
- \* Fast Switching Characteristic
- \* Small Footprint & Low Profile Package



| 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 <sub>DS</sub>                      | 30       | V    |
| Gate-Source Voltage   | V <sub>GS</sub>                      | ± 20     | V    |
| Continuous Drain Current <sup>3</sup> , V <sub>GS</sub> @4.5V | I <sub>b</sub> @T <sub>c</sub> =25°C | 5.5      | A    |
| Continuous Drain Current <sup>3</sup> , V <sub>GS</sub> @4.5V | I <sub>b</sub> @T <sub>c</sub> =70°C | 4.4      | A    |
| Pulsed Drain Current <sup>1,2</sup>                           | I <sub>bm</sub>                      | 20       | A    |
| Total Power Dissipation                                       | P <sub>D</sub> @T <sub>c</sub> =25°C | 2        | W    |
| Linear Derating Factor  |                                      | 0.016    | 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-case <sup>3</sup> Max. | R <sub>thj-c</sub> | 62.5    | °C/W |



Elektronische Bauelemente

**STT2604**5.5 A, 30V, R<sub>DS(ON)</sub> 45mΩ

N-Channel Enhancement Mode Power Mos.FET

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

| Parameter   | Symbol                              | Min. | Typ. | Max. | Unit | Test Condition  |
|---|-------------------------------------|------|------|------|------|---|
| Drain-Source Breakdown Voltage                      | BV <sub>DSS</sub>                   | 30   | -    | -    | V    | V <sub>GS</sub> =0V, I <sub>D</sub> =250uA  |
| Breakdown Voltage Temp. Coefficient                 | ΔBV <sub>DSS</sub> /ΔT <sub>j</sub> | -    | 0.02 | -    | 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  |
| 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> =55°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>                 | -    | -    | 45   | mΩ   | V <sub>GS</sub> =10V, I <sub>D</sub> =4.8A  |
|   |                                     | -    | -    | 65   |      | V <sub>GS</sub> =4.5V, I <sub>D</sub> =2.4A   |
| Total Gate Charge <sup>2</sup>                      | Q <sub>g</sub>                      | -    | 6    | 10   | nC   | I <sub>D</sub> =4.8A<br>V <sub>DS</sub> =24V<br>V <sub>GS</sub> =4.5V   |
| Gate-Source Charge                                  | Q <sub>gs</sub>                     | -    | 2    | -    |      |   |
| Gate-Drain ("Miller") Charge                        | Q <sub>gd</sub>                     | -    | 3    | -    |      |   |
| Turn-on Delay Time <sup>2</sup>                     | T <sub>d(ON)</sub>                  | -    | 6    | -    | nS   | V <sub>DD</sub> =15V<br>I <sub>D</sub> =1A<br>V <sub>GS</sub> =10V<br>R <sub>G</sub> =3.3Ω<br>R <sub>D</sub> =15Ω |
| Rise Time   | T <sub>r</sub>                      | -    | 8    | -    |      |   |
| Turn-off Delay Time                                 | T <sub>d(OFF)</sub>                 | -    | 15   | -    |      |   |
| Fall Time   | T <sub>f</sub>                      | -    | 4    | -    |      |   |
| Input Capacitance                                   | C <sub>iss</sub>                    | -    | 440  | 705  | pF   | V <sub>GS</sub> =0V<br>V <sub>DS</sub> =25V<br>f=1.0MHz   |
| Output Capacitance                                  | C <sub>oss</sub>                    | -    | 105  | -    |      |   |
| Reverse Transfer Capacitance                        | C <sub>rss</sub>                    | -    | 35   | -    |      |   |
| Forward Transconductance                            | G <sub>fs</sub>                     | -    | 7    | -    | S    | V <sub>DS</sub> =10V, I <sub>D</sub> =4.8A  |

**Source-Drain Diode**

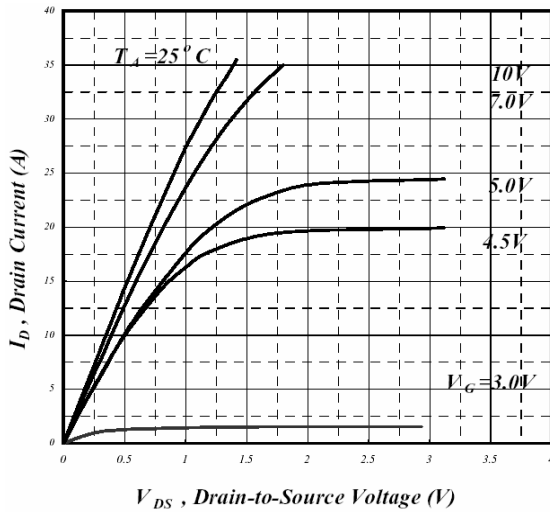
| Parameter                          | Symbol          | Min. | Typ. | Max. | Unit | Test Condition                             |
|------------------------------------|-----------------|------|------|------|------|--|
| Forward On Voltage <sup>2</sup>    | V <sub>SD</sub> | -    | -    | 1.2  | V    | I <sub>S</sub> =4.8A, V <sub>GS</sub> =0V. |
| Reverse Recovery Time <sup>2</sup> | T <sub>rr</sub> | -    | 15   | -    | nS   | I <sub>S</sub> =4.8A, V <sub>GS</sub> =0V. |
| Reverse Recovery Charge            | Q <sub>rr</sub> | -    | 7    | -    | nC   | dI/dt=100A/us                              |

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

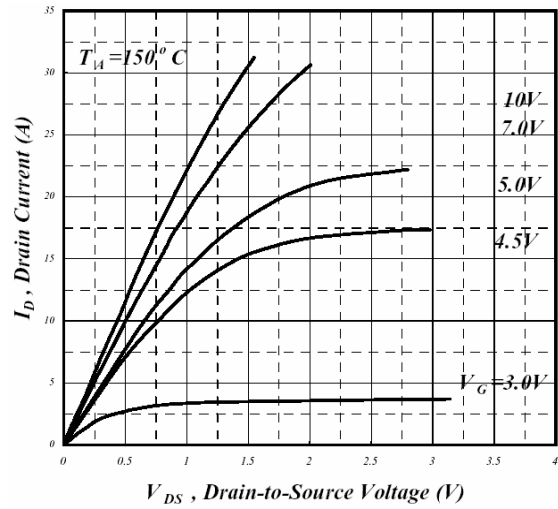
2.Pulse width ≤300us, dutycycle ≤2%.

3.Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board; 156°C/W when mounted on Min. copper pad.

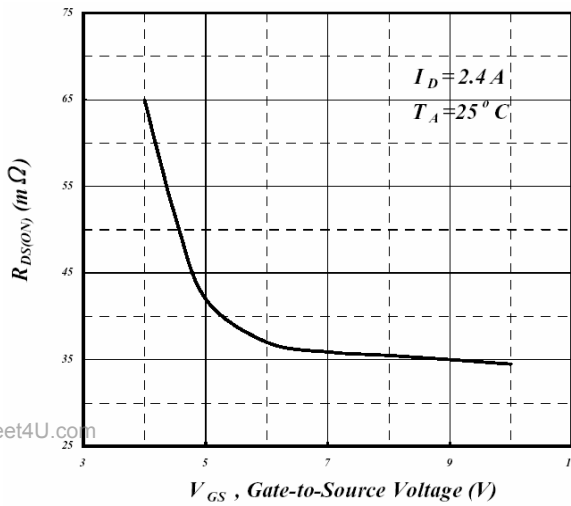
**Characteristics Curve**



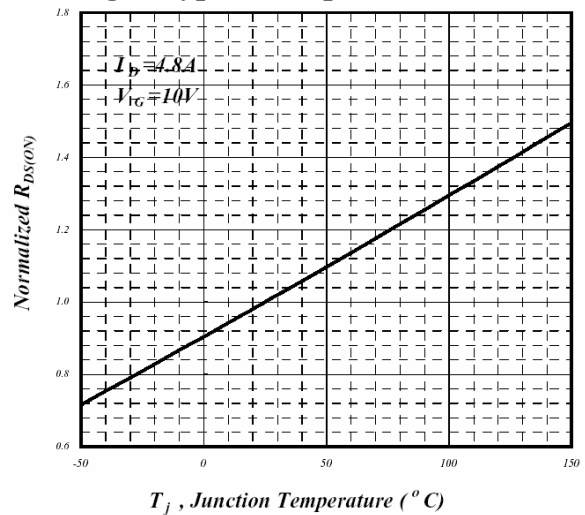
**Fig 1. Typical Output Characteristics**



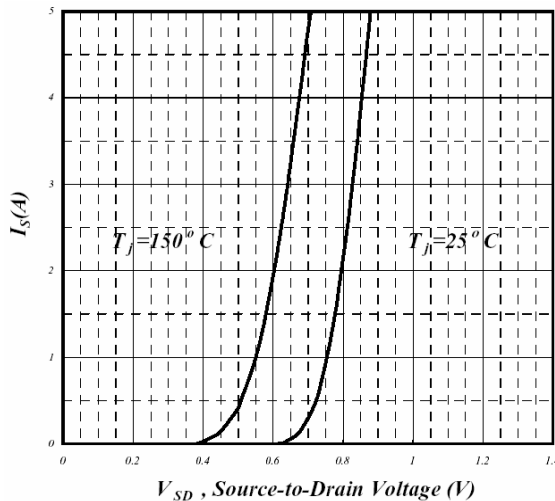
**Fig 2. Typical Output Characteristics**



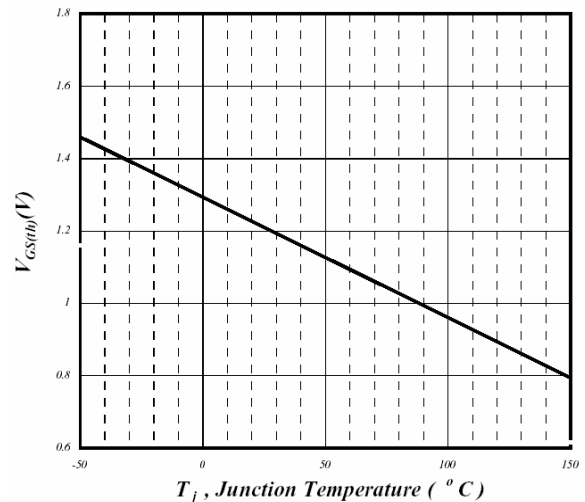
**Fig 3. On-Resistance v.s. Gate Voltage**



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



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



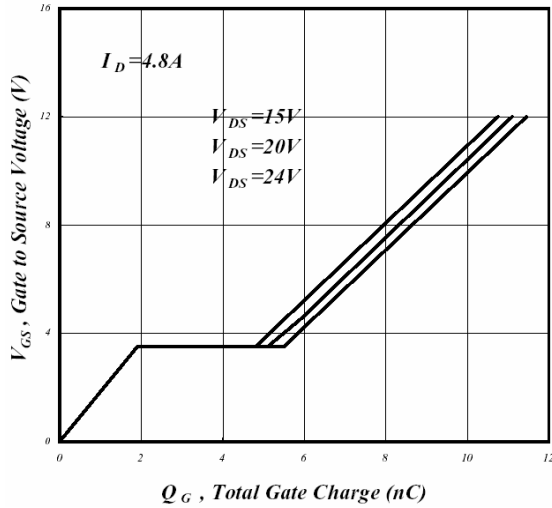
**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**

Any changing of specification will not be informed individual

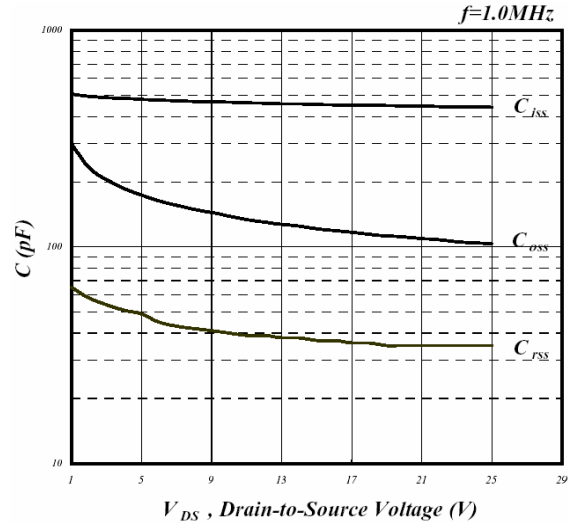
**STT2604**

5.5A, 30V, R<sub>DS(ON)</sub> 45mΩ

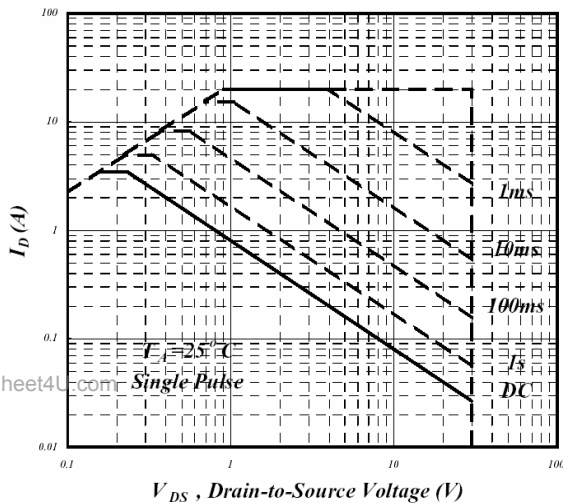
N-Channel Enhancement Mode Power Mos.FET



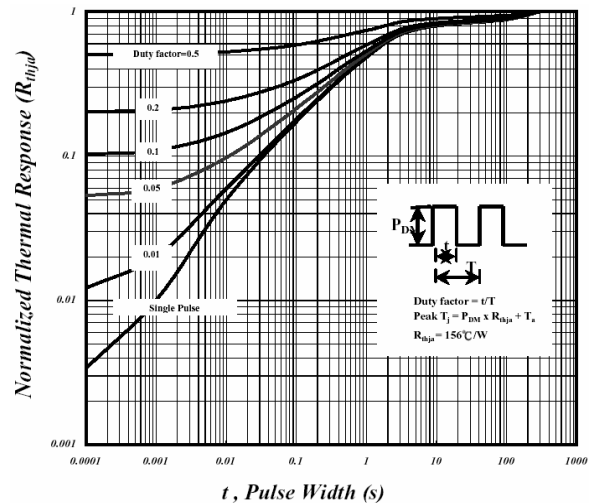
**Fig 7. Gate Charge Characteristics**



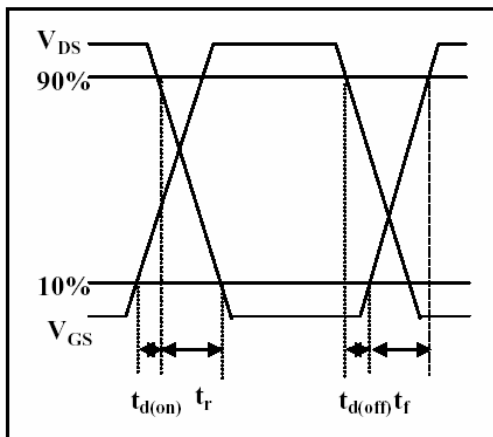
**Fig 8. Typical Capacitance Characteristics**



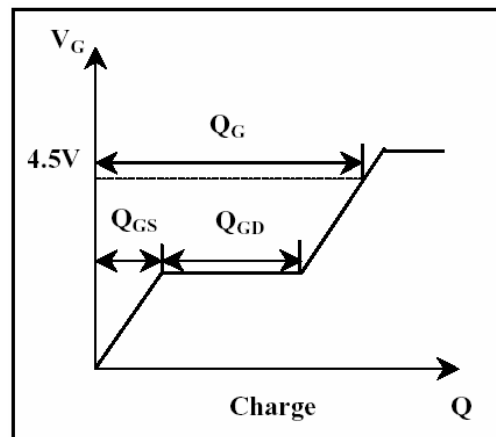
**Fig 9. Maximum Safe Operating Area**



**Fig 10. Effective Transient Thermal Impedance**



**Fig 11. Switching Time Waveform**



**Fig 12. Gate Charge Waveform**