

**TF8205A Dual N-Channel MOSFET**

| $V_{(BR)DSS}$ | $R_{DS(on)}$ (typ)    | $I_D$ Max |
|---------------|-----------------------|-----------|
| 20V           | 0.017 $\Omega$ @ 4.5V | 6.0A      |
|               | 0.020 $\Omega$ @ 2.5V |           |

**FEATURE**

- TrenchFET Power MOSFET
- Excellent  $R_{DS(on)}$
- Low Gate Charge
- High Power and Current Handling Capability
- Surface Mount Package

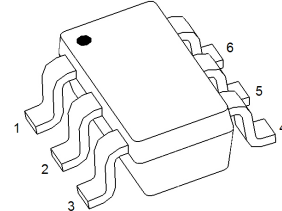
**APPLICATION**

- Battery Protection
- Load Switch
- Power Management

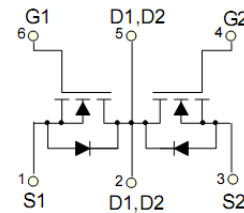
**MARKING INFORMATION**

- 8205A:TF8205A
- Y :year code W :week code

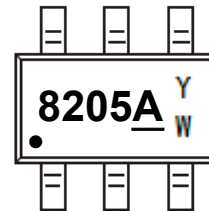
**SOT-23-6**



**Equivalent Circuit**



**MARKING**



**ABSOLUTE MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$  unless otherwise noted)**

| Parameter                                                        | Symbol          | Value    | Unit               |
|------------------------------------------------------------------|-----------------|----------|--------------------|
| Drain-Source Voltage                                             | $V_{DS}$        | 20       | V                  |
| Gate-Source Voltage                                              | $V_{GS}$        | $\pm 12$ | V                  |
| Continuous Drain Current                                         | $I_D$           | 6        | A                  |
| Pulsed Drain Current (note 1)                                    | $I_{DM}$        | 15       | A                  |
| Thermal Resistance from Junction to Ambient (note 2)             | $R_{\theta JA}$ | 100      | $^\circ\text{C/W}$ |
| Junction Temperature                                             | $T_J$           | 150      | $^\circ\text{C}$   |
| Storage Temperature                                              | $T_{STG}$       | -55~+150 | $^\circ\text{C}$   |
| Lead Temperature for Soldering Purposes(1/8" from case for 10 s) | $T_L$           | 260      | $^\circ\text{C}$   |

**MOSFET ELECTRICAL CHARACTERISTICS**

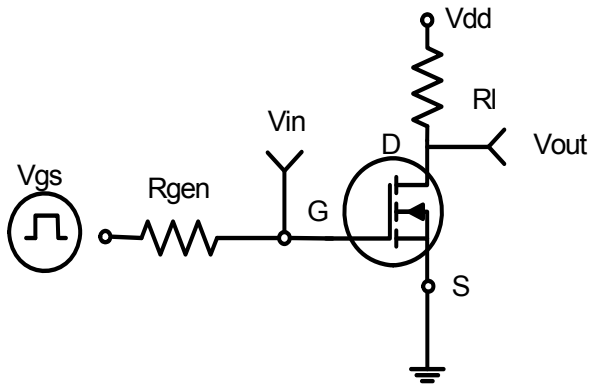
**T<sub>a</sub> =25 °C unless otherwise specified**

| Parameter                           | Symbol               | Test Condition                                                                        | Min | Typ  | Max  | Unit |
|-------------------------------------|----------------------|---------------------------------------------------------------------------------------|-----|------|------|------|
| STATIC CHARACTERICTISCS             |                      |                                                                                       |     |      |      |      |
| Drain-source breakdown voltage      | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA                                           | 20  |      |      | V    |
| Zero gate voltage drain current     | I <sub>DSS</sub>     | V <sub>DS</sub> =18V,V <sub>GS</sub> = 0V                                             |     |      | 500  | nA   |
| Gate-body leakage current           | I <sub>GSS</sub>     | V <sub>GS</sub> =±12V, V <sub>DS</sub> = 0V                                           |     |      | ±100 | nA   |
| Gate threshold voltage (note 3)     | V <sub>GS(th)</sub>  | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                              | 0.5 | 0.7  | 1.0  | V    |
| Drain-source on-resistance (note 3) | R <sub>DS(on)</sub>  | V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A                                             |     | 17   | 21   | mΩ   |
|                                     |                      | V <sub>GS</sub> =2.5V, I <sub>D</sub> =4A                                             |     | 20   | 26   | mΩ   |
| Forward tranconductance (note 3)    | g <sub>FS</sub>      | V <sub>DS</sub> =5V, I <sub>D</sub> =5A                                               |     | 10   |      | S    |
| Diode forward voltage (note 3)      | V <sub>SD</sub>      | I <sub>S</sub> =1.25A, V <sub>GS</sub> = 0V                                           |     |      | 1.2  | V    |
| DYNAMIC CHARACTERICTISCS (note4)    |                      |                                                                                       |     |      |      |      |
| Input Capacitance                   | C <sub>iss</sub>     | V <sub>DS</sub> =10V,V <sub>GS</sub> =0V,f =1MHz                                      |     | 800  |      | pF   |
| Output Capacitance                  | C <sub>oss</sub>     |                                                                                       |     | 155  |      | pF   |
| Reverse Transfer Capacitance        | C <sub>rss</sub>     |                                                                                       |     | 125  |      | pF   |
| SWITCHING CHARACTERICTISCS (note 4) |                      |                                                                                       |     |      |      |      |
| Turn-on delay time                  | t <sub>d(on)</sub>   | V <sub>DD</sub> =10V,V <sub>GS</sub> =4V,<br>I <sub>D</sub> =1A,R <sub>GEN</sub> =10Ω |     | 18   |      | ns   |
| Turn-on rise time                   | t <sub>r</sub>       |                                                                                       |     | 4.8  |      | ns   |
| Turn-off delay time                 | t <sub>d(off)</sub>  |                                                                                       |     | 43.5 |      | ns   |
| Turn-off fall time                  | t <sub>f</sub>       |                                                                                       |     | 20   |      | ns   |
| Total Gate Charge                   | Q <sub>g</sub>       | V <sub>DS</sub> =10V,V <sub>GS</sub> =4.5V,I <sub>D</sub> =4A                         |     | 11   |      | nC   |
| Gate-Source Charge                  | Q <sub>gs</sub>      |                                                                                       |     | 2.2  |      | nC   |
| Gate-Drain Charge                   | Q <sub>gd</sub>      |                                                                                       |     | 2.5  |      | nC   |

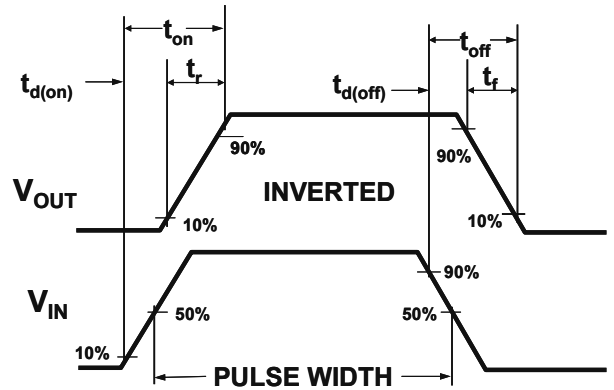
**Notes :**

- 1.Repetitive rating: Pluse width limited by maximum junction temperature
- 2.Surface Mounted on FR4 board, t ≤10 sec.
3. Pulse test : Pulse width ≤300μs, duty cycle ≤2%.
4. Guaranteed by design, not subject to production.

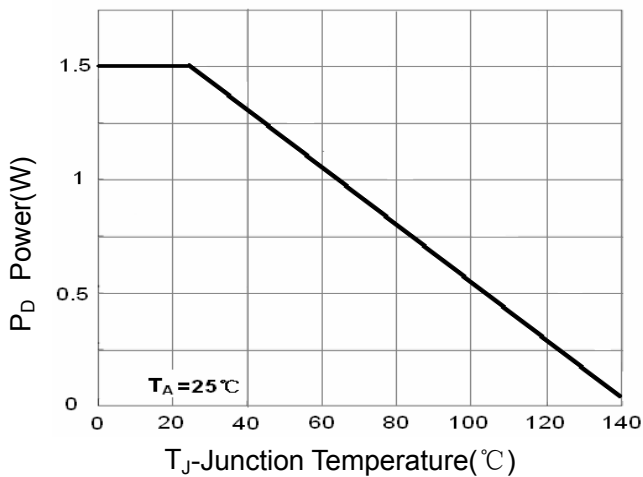
**Typical Electrical and Thermal Characteristics**



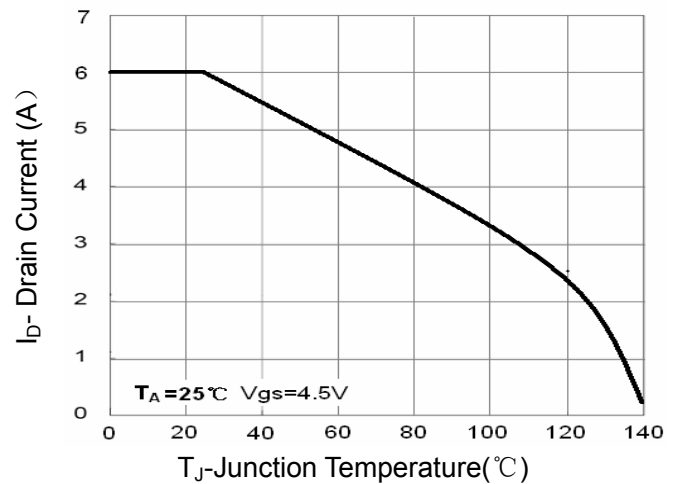
**Figure 1: Switching Test Circuit**



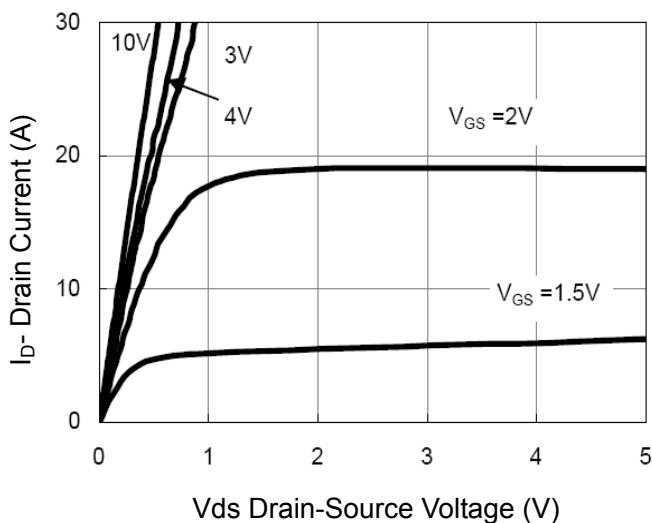
**Figure 2: Switching Waveforms**



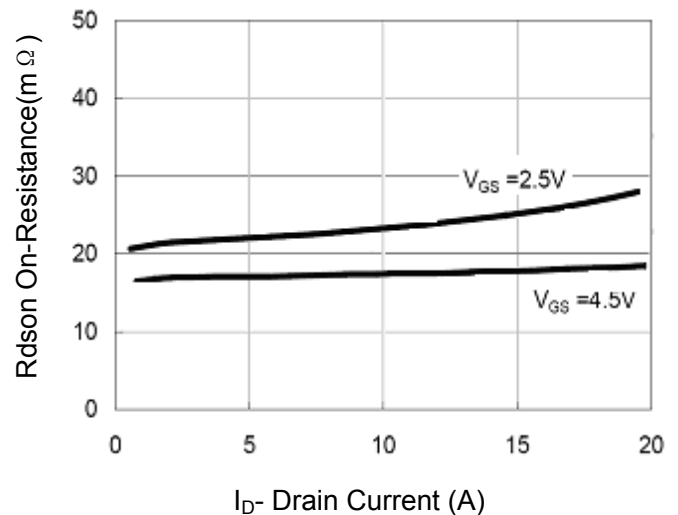
**Figure 3 Power Dissipation**



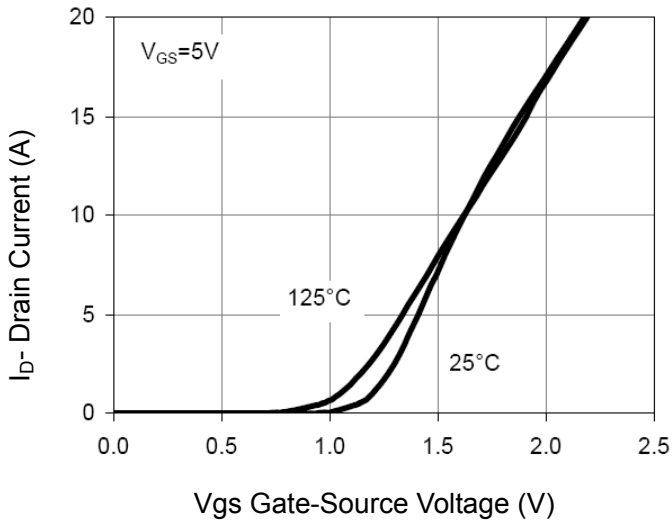
**Figure 4 Drain Current**



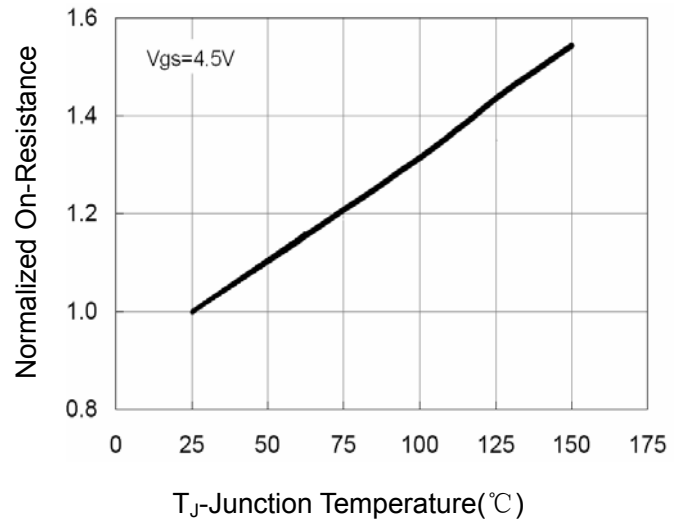
**Figure 5 Output Characteristics**



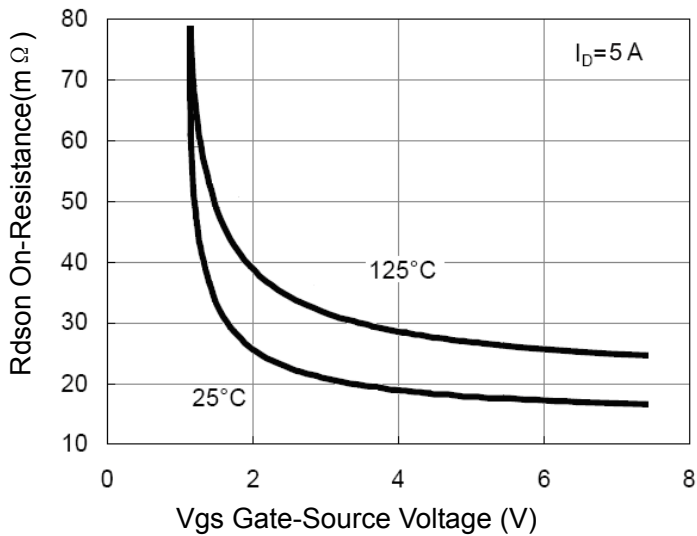
**Figure 6 Drain-Source On-Resistance**



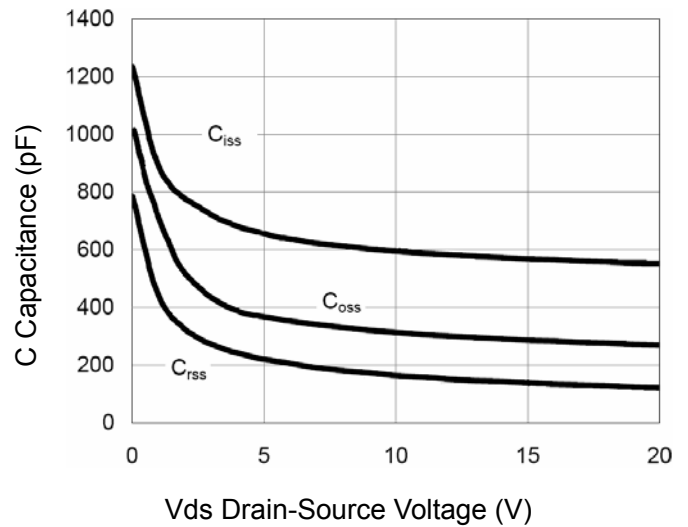
**Figure 7 Transfer Characteristics**



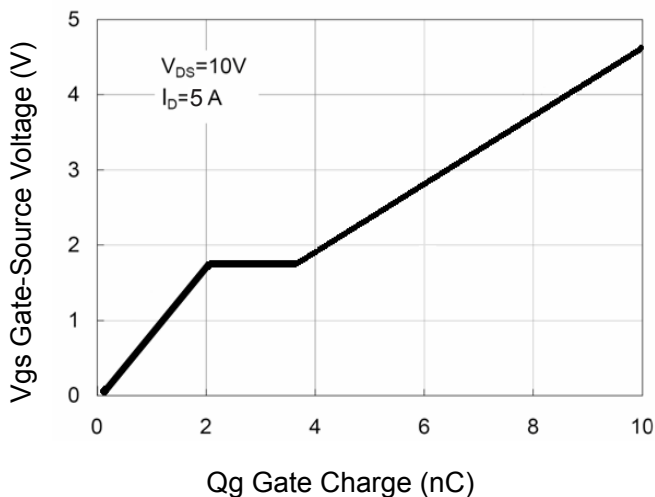
**Figure 8 Drain-Source On-Resistance**



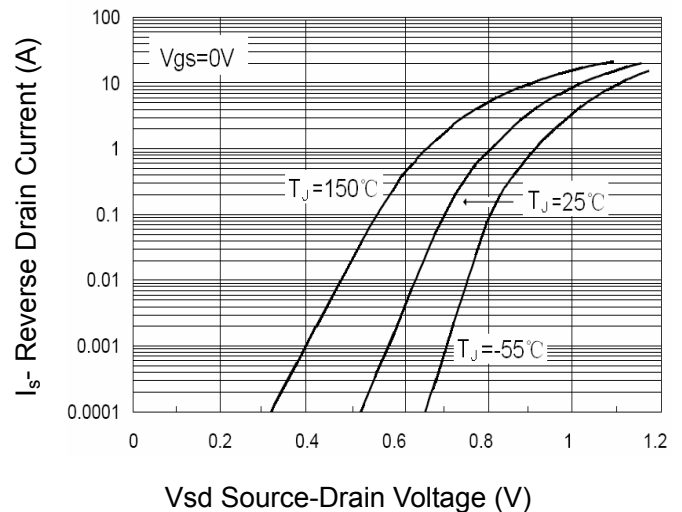
**Figure 9 Rdson vs VGS**



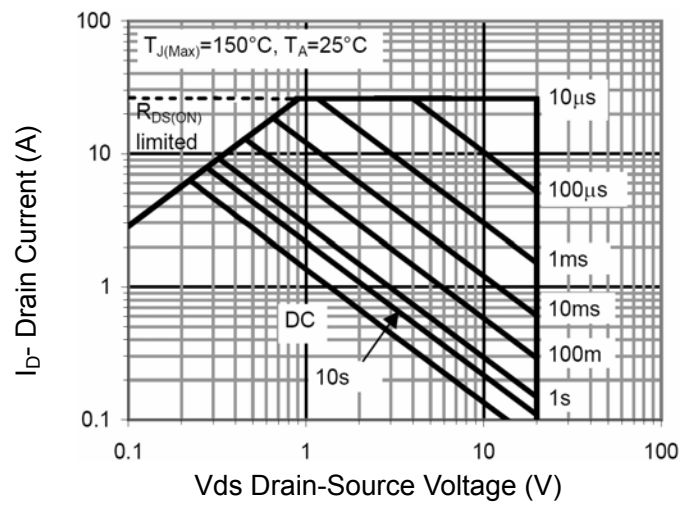
**Figure 10 Capacitance vs Vds**



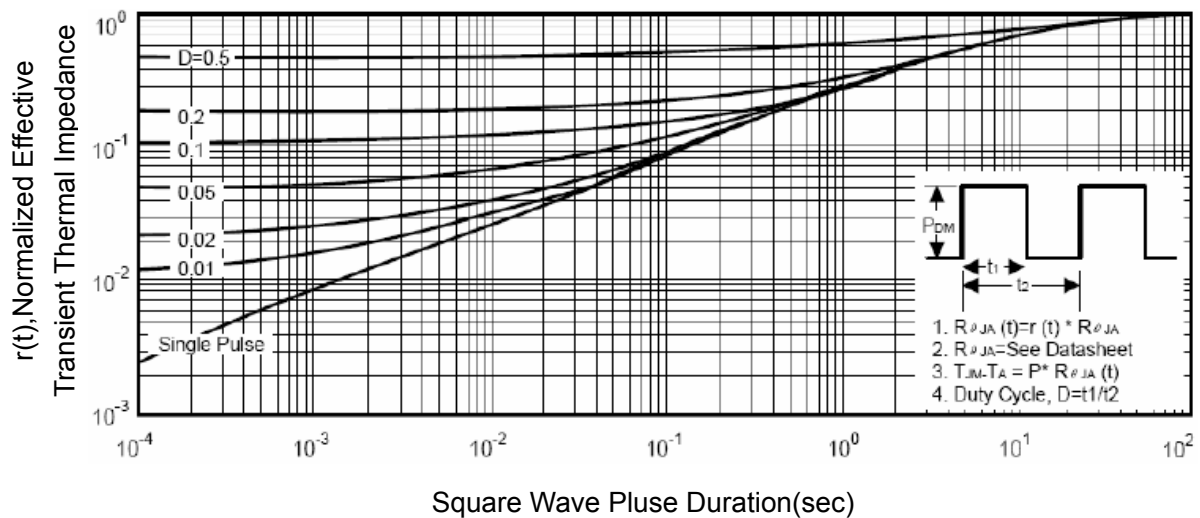
**Figure 11 Gate Charge**



**Figure 12 Source- Drain Diode Forward**

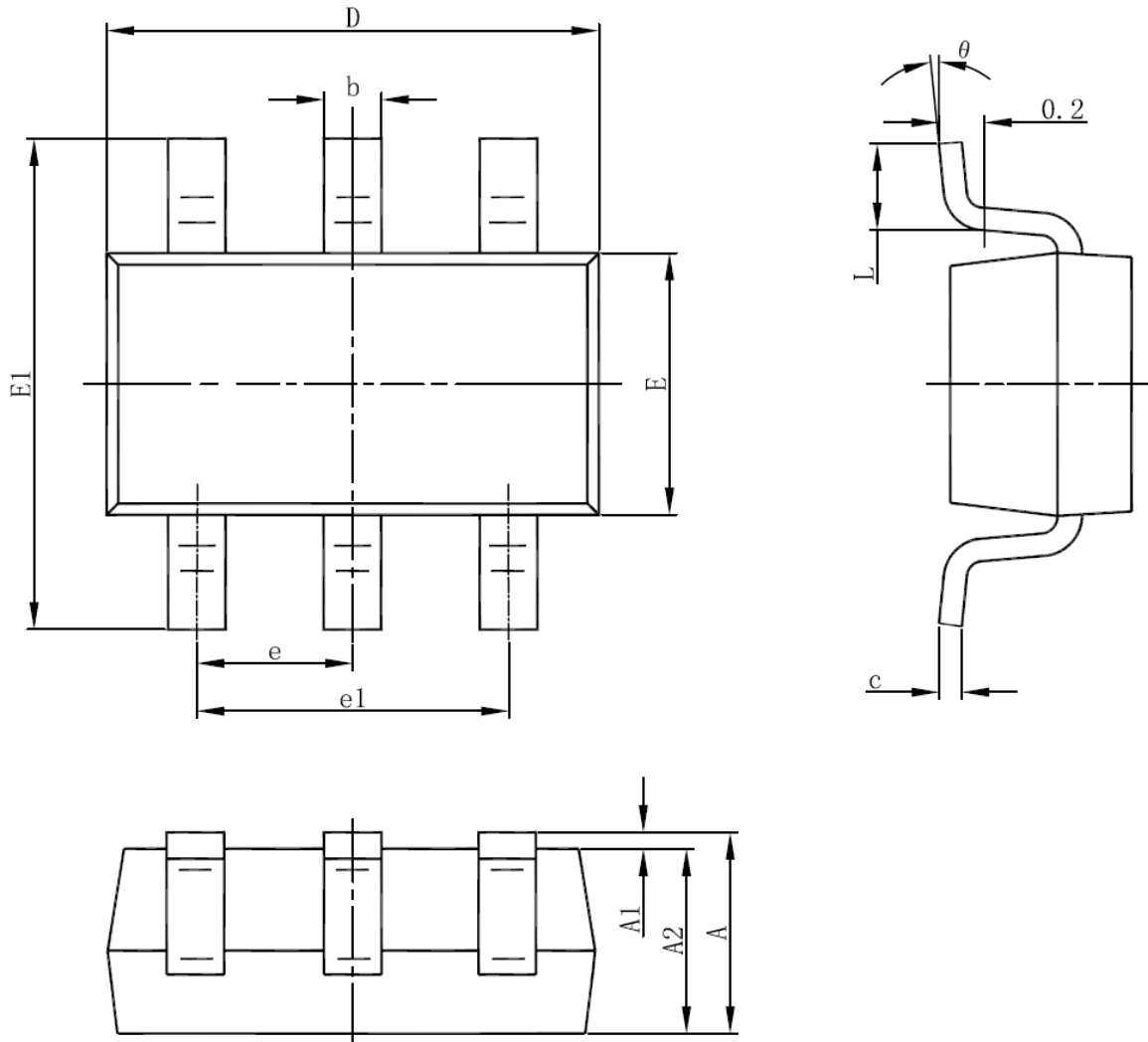


**Figure 13 Safe Operation Area**



**Figure 14 Normalized Maximum Transient Thermal Impedance**

**SOT23-6 Package Information**



| Symbol   | Dimensions In Millimeters |       | Dimensions In Inches |       |
|----------|---------------------------|-------|----------------------|-------|
|          | Min                       | Max   | Min                  | Max   |
| A        | 1.050                     | 1.250 | 0.041                | 0.049 |
| A1       | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2       | 1.050                     | 1.150 | 0.041                | 0.045 |
| b        | 0.300                     | 0.500 | 0.012                | 0.020 |
| c        | 0.100                     | 0.200 | 0.004                | 0.008 |
| D        | 2.820                     | 3.020 | 0.111                | 0.119 |
| E        | 1.500                     | 1.700 | 0.059                | 0.067 |
| E1       | 2.650                     | 2.950 | 0.104                | 0.116 |
| e        | 0.950(BSC)                |       | 0.037(BSC)           |       |
| e1       | 1.800                     | 2.000 | 0.071                | 0.079 |
| L        | 0.300                     | 0.600 | 0.012                | 0.024 |
| $\theta$ | 0°                        | 8°    | 0°                   | 8°    |