

2SK2196  
(F20W50VX2)

500V 20A

FEATURES

- Input capacitance (Ciss) is small.  
Especially, input capacitance at 0 bias is small.
- The static Rds(on) is small.
- The switching time is fast.

APPLICATION

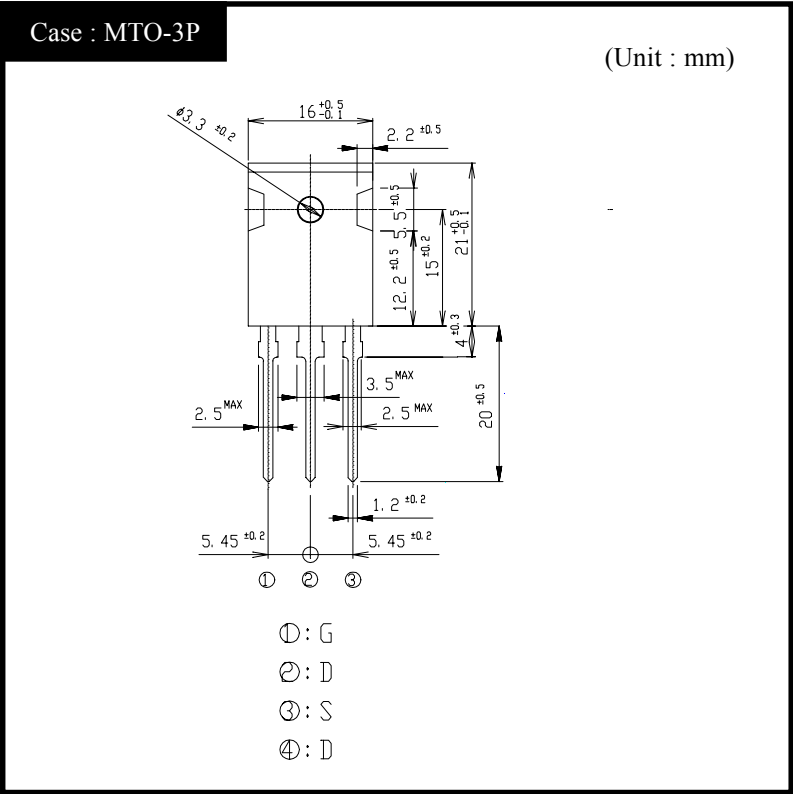
- Switching power supply of AC 100V input
- High voltage power supply
- Inverter

RATINGS

●Absolute Maximum Ratings (Tc = 25°C)

| Item                            | Symbol           | Conditions                       | Ratings | Unit |
|---------------------------------|------------------|----------------------------------|---------|------|
| Storage Temperature             | T <sub>stg</sub> |                                  | -55~150 | °C   |
| Channel Temperature             | T <sub>ch</sub>  |                                  | 150     |      |
| Drain-Source Voltage            | V <sub>DSS</sub> |                                  | 500     | V    |
| Gate-Source Voltage             | V <sub>GSS</sub> |                                  | ±30     |      |
| Continuous Drain Current (DC)   | I <sub>d</sub>   |                                  | 20      | A    |
| Continuous Drain Current (Peak) | I <sub>DP</sub>  |                                  | 60      |      |
| Continuous Source Current (DC)  | I <sub>s</sub>   |                                  | 20      |      |
| Total Power Dissipation         | P <sub>T</sub>   |                                  | 125     | W    |
| Single Pulse Avalanche Current  | I <sub>AS</sub>  | T <sub>ch</sub> = 25°C           | 20      | A    |
| Mounting Torque                 | TOR              | ( Recommended torque : 0.5 N·m ) | 0.8     | N·m  |

OUTLINE DIMENSIONS

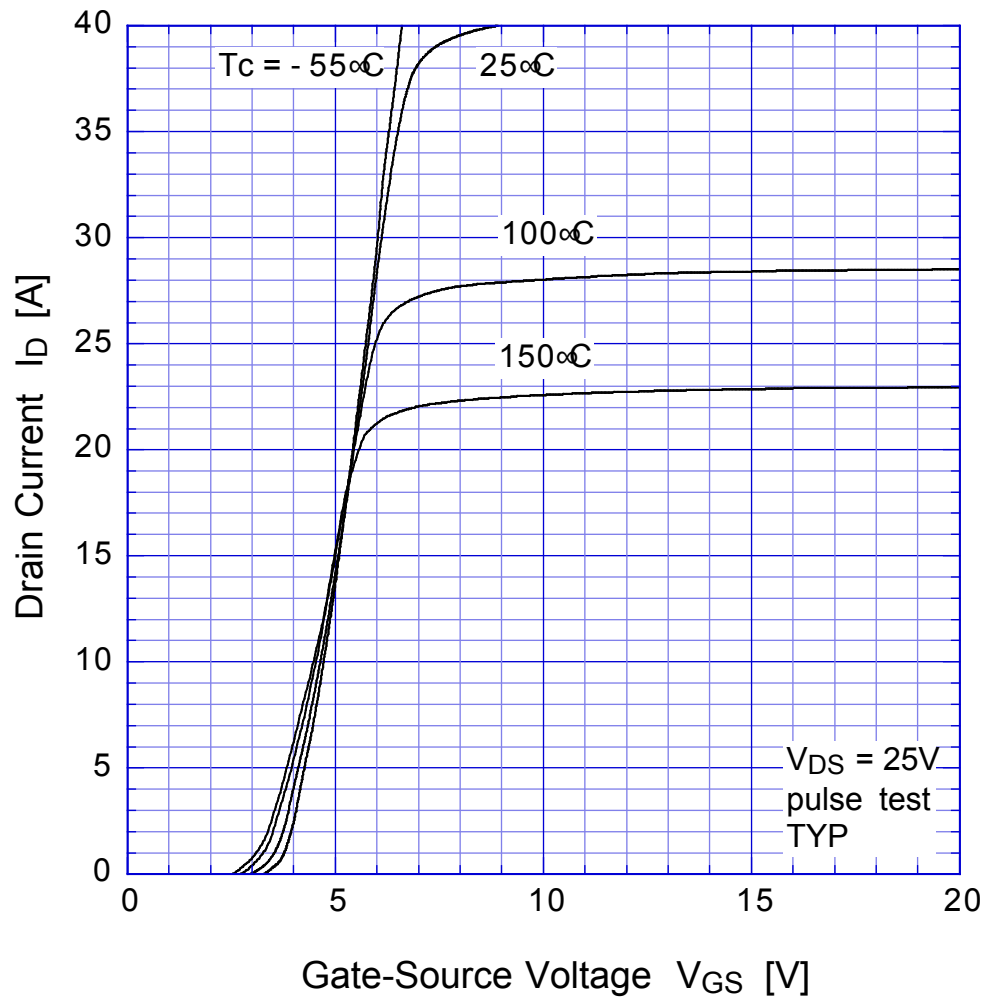


## ●Electrical Characteristics T<sub>c</sub> = 25°C

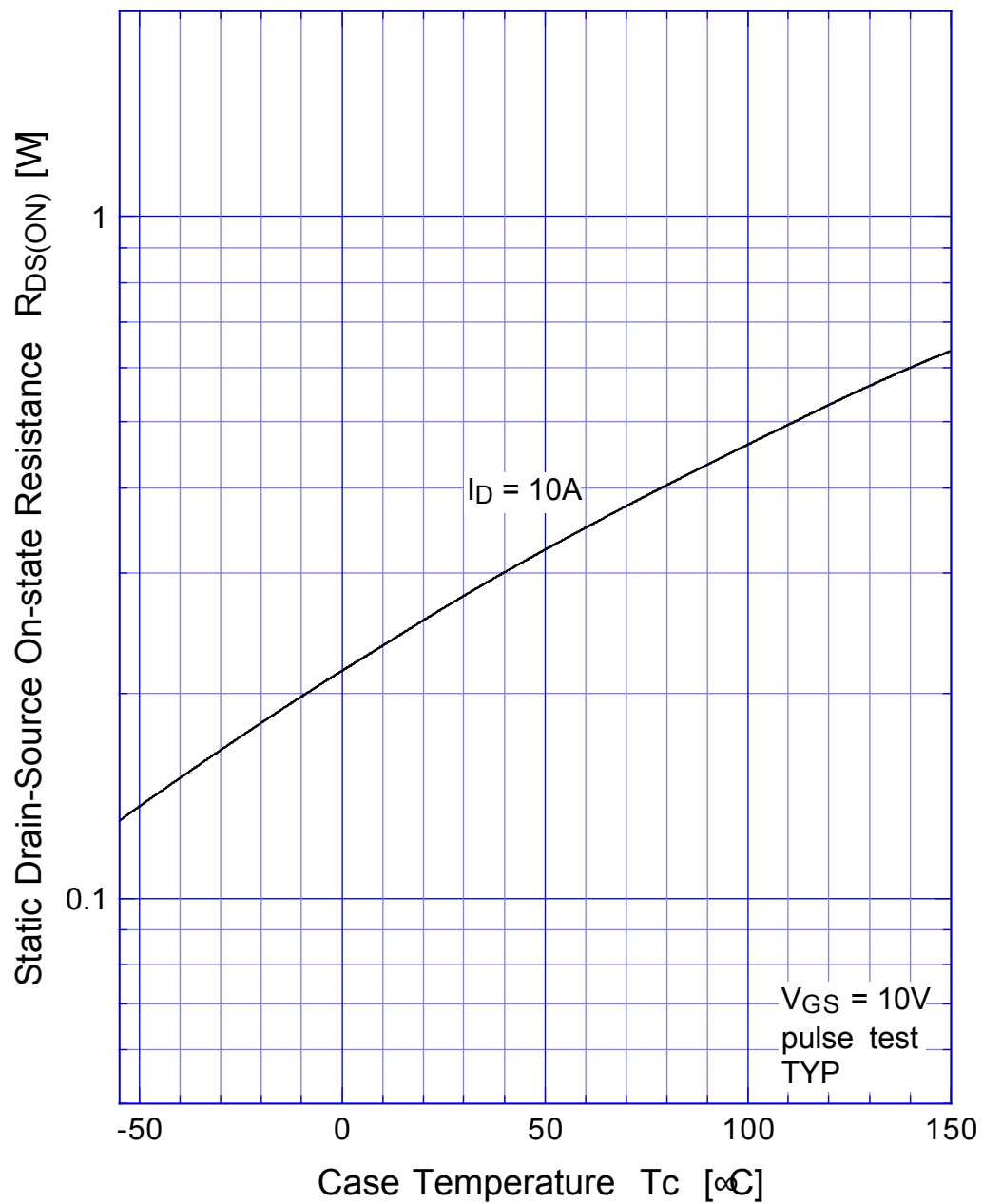
| Item                                    | Symbol              | Conditions                                                          | Min. | Typ. | Max. | Unit |
|-----------------------------------------|---------------------|---------------------------------------------------------------------|------|------|------|------|
| Drain-Source Breakdown Voltage          | V(BR)DSS            | I <sub>D</sub> = 1mA, V <sub>GS</sub> = 0V                          | 500  |      |      | V    |
| Zero Gate Voltage Drain Current         | I <sub>DSS</sub>    | V <sub>DS</sub> = 500V, V <sub>GS</sub> = 0V                        |      |      | 250  | μ A  |
| Gate-Source Leakage Current             | I <sub>GSS</sub>    | V <sub>GS</sub> = ±30V, V <sub>DS</sub> = 0V                        |      |      | ±0.1 |      |
| Forward Transconductance                | g <sub>fs</sub>     | I <sub>D</sub> = 10A, V <sub>DS</sub> = 10V                         | 6    | 15   |      | S    |
| Static Drain-Source On-state Resistance | R <sub>DS(ON)</sub> | I <sub>D</sub> = 10A, V <sub>GS</sub> = 10V                         |      | 0.27 | 0.35 | Ω    |
| Gate Threshold Voltage                  | V <sub>TH</sub>     | I <sub>D</sub> = 1mA, V <sub>DS</sub> = 10V                         | 2.5  | 3.0  | 3.5  | V    |
| Source-Drain Diode Forwade Voltage      | V <sub>SD</sub>     | I <sub>S</sub> = 10A, V <sub>GS</sub> = 0V                          |      |      | 1.5  |      |
| Thermal Resistance                      | θ <sub>jc</sub>     | junction to case                                                    |      |      | 1.0  | °C/W |
| Total Gate Charge                       | Q <sub>g</sub>      | V <sub>DD</sub> = 400V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 20A |      | 85   |      | nC   |
| Input Capacitance                       | C <sub>iss</sub>    | V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V, f = 1MHz               |      | 2400 |      | pF   |
| Reverse Transfer Capacitance            | C <sub>rss</sub>    |                                                                     |      | 170  |      |      |
| Output Capacitance                      | C <sub>oss</sub>    |                                                                     |      | 500  |      |      |
| Turn-On Time                            | t <sub>on</sub>     | I <sub>D</sub> = 10A, V <sub>GS</sub> = 10V, R <sub>L</sub> = 15Ω   |      | 135  | 225  | ns   |
| Turn-Off Time                           | t <sub>off</sub>    |                                                                     |      | 340  | 565  |      |

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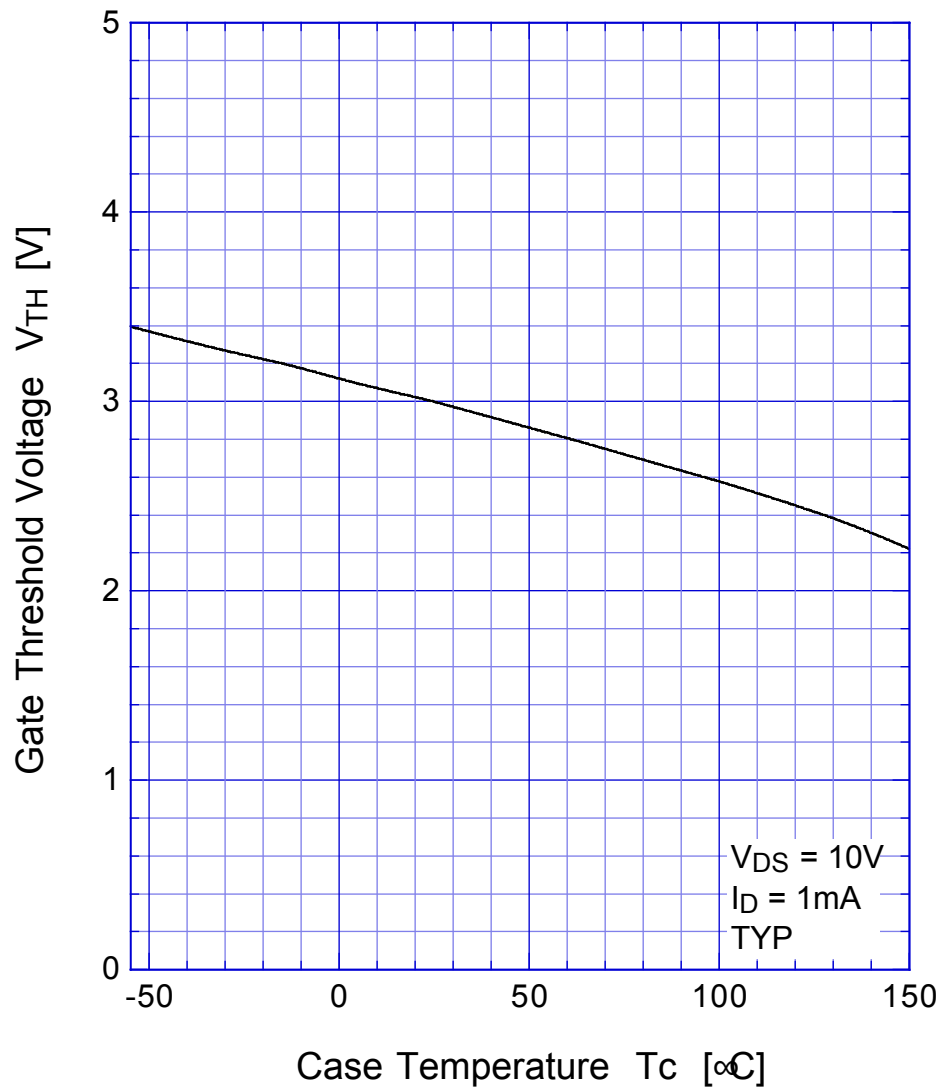
Transfer Characteristics



## 2SK2196 Static Drain-Source On-state Resistance

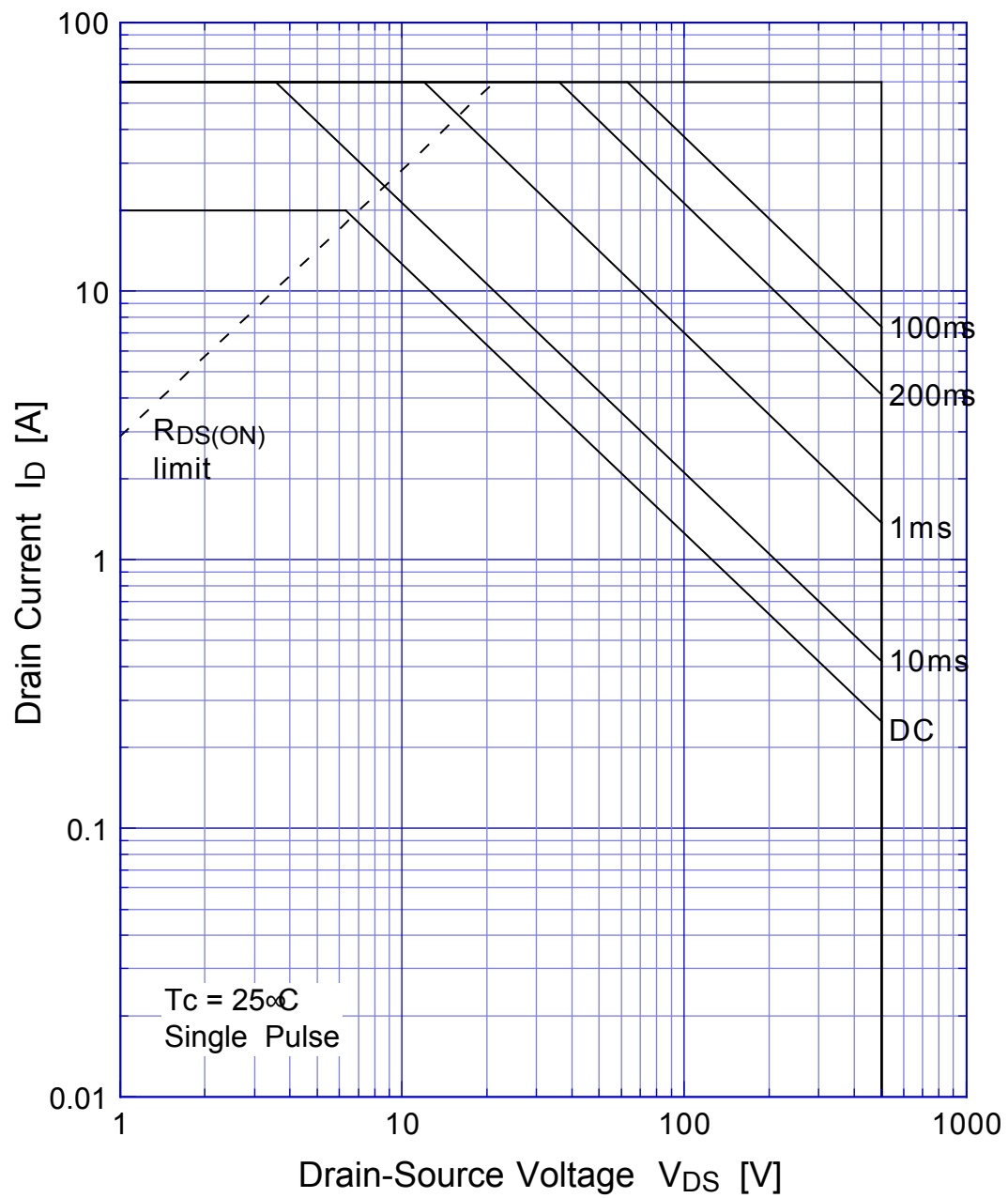


## 2SK2196 Gate Threshold Voltage

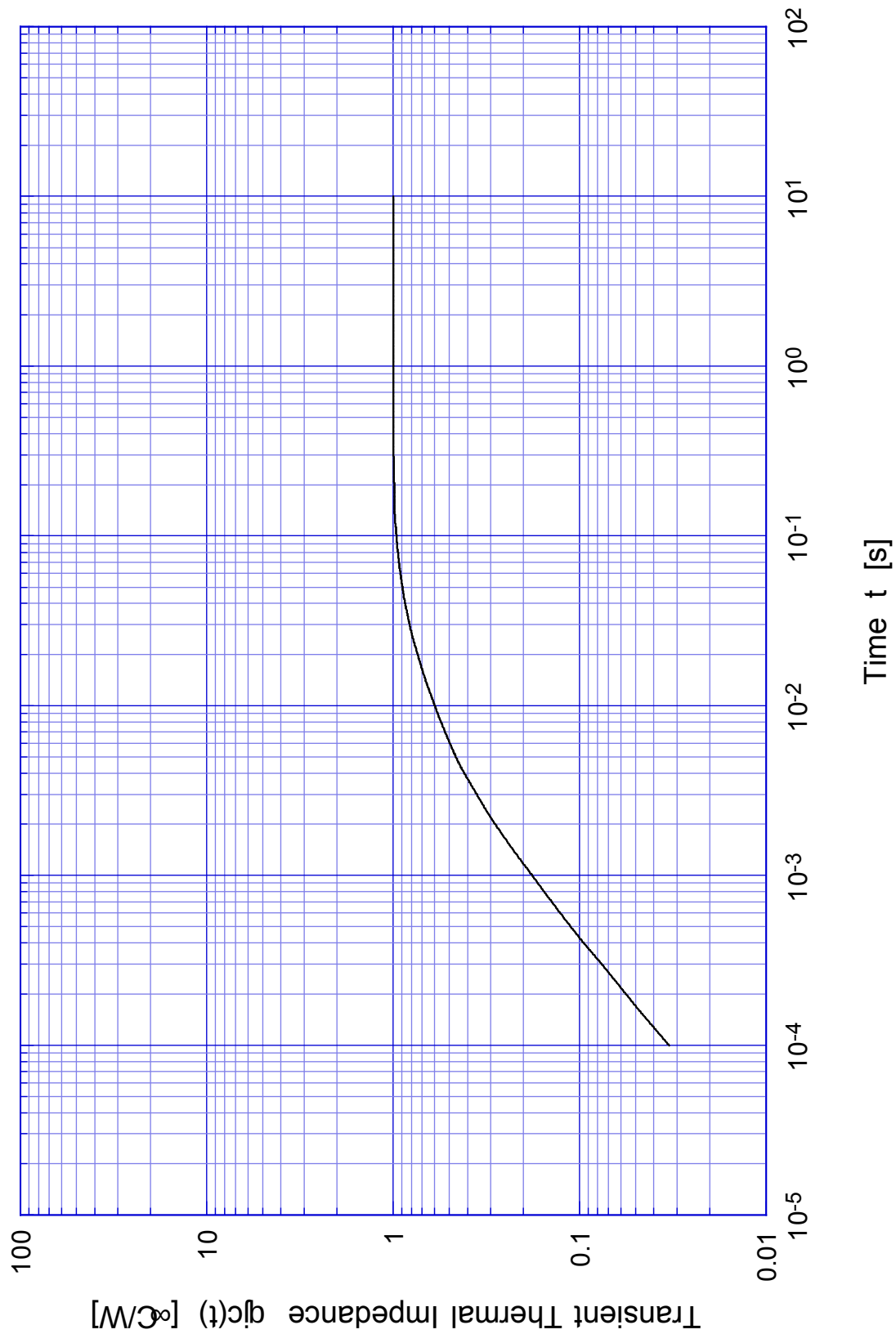


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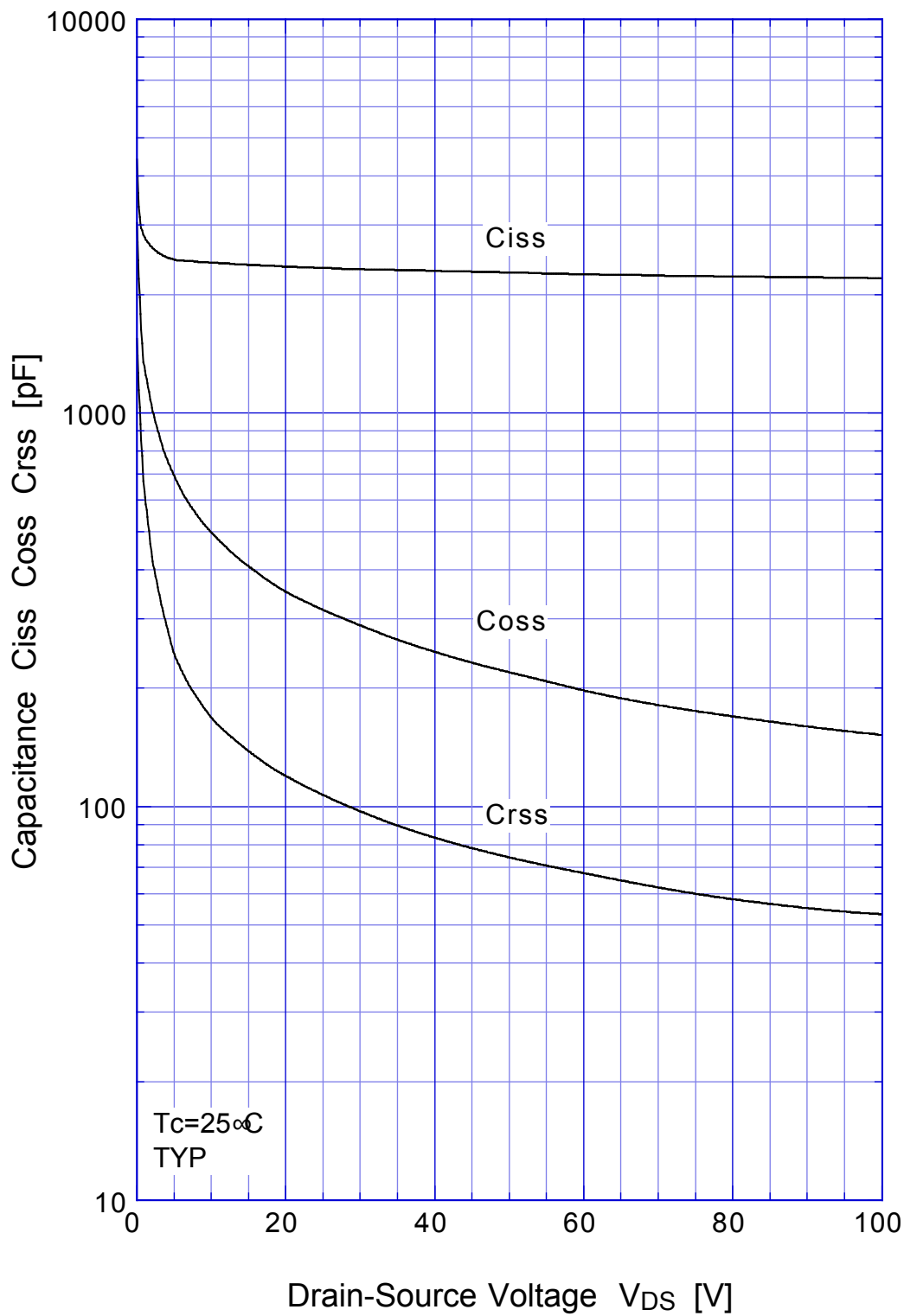
Safe Operating Area



# 2SK2196      Transient Thermal Impedance



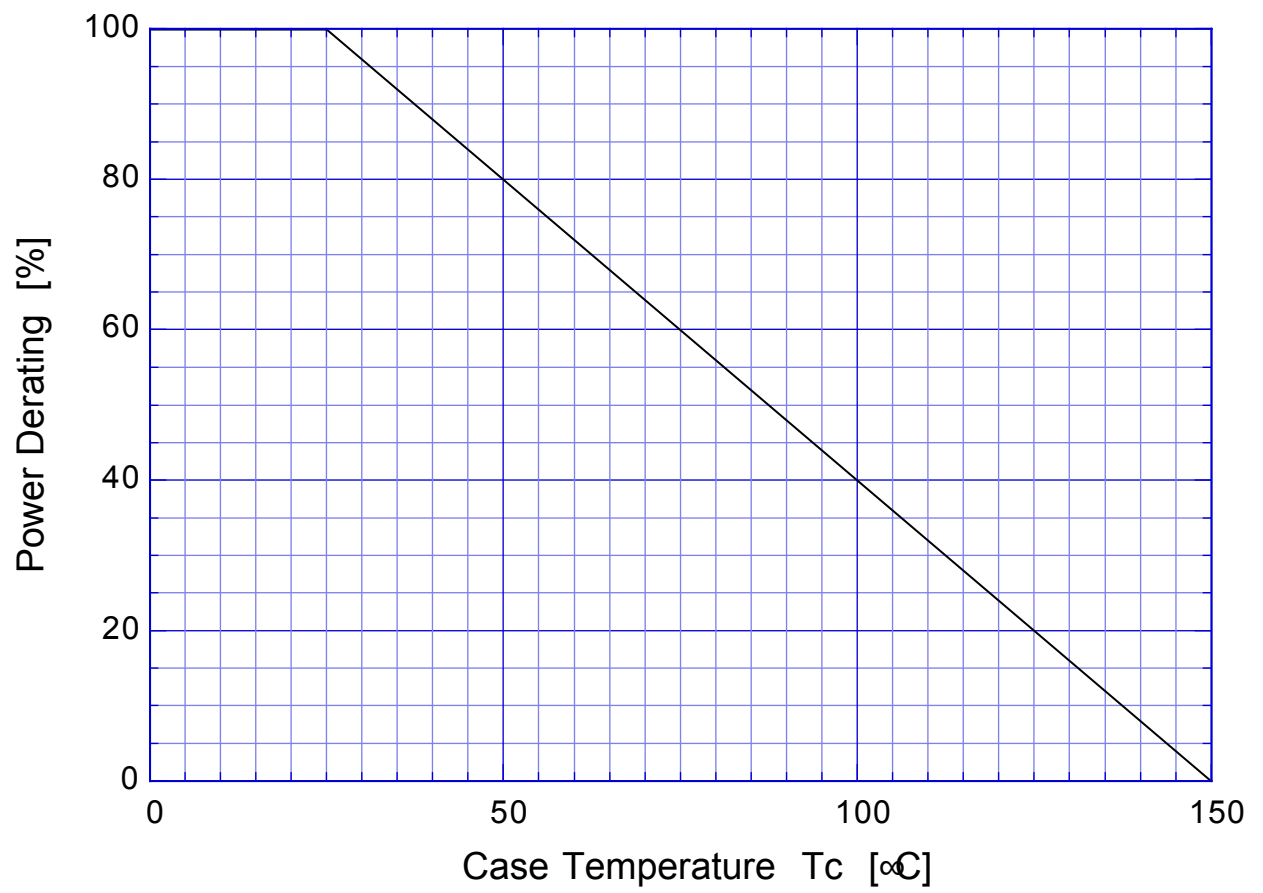
2SK2196 Capacitance





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Power Derating



## 2SK2196

## Gate Charge Characteristics

