

## VX-2 Series Power MOSFET

N-Channel Enhancement type

**2SK3013**  
**(FP16W60VX2)**

**600V 16A**

### 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.
- Avalanche resistance guaranteed.

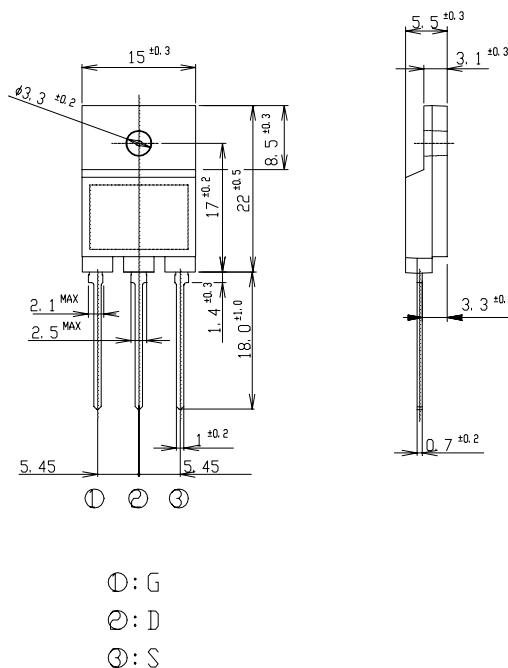
### APPLICATION

- Switching power supply of  
AC 100-200V input
- Inverter
- Power Factor Control Circuit

### OUTLINE DIMENSIONS

Case : ITO-3P

(Unit : mm)



### RATINGS

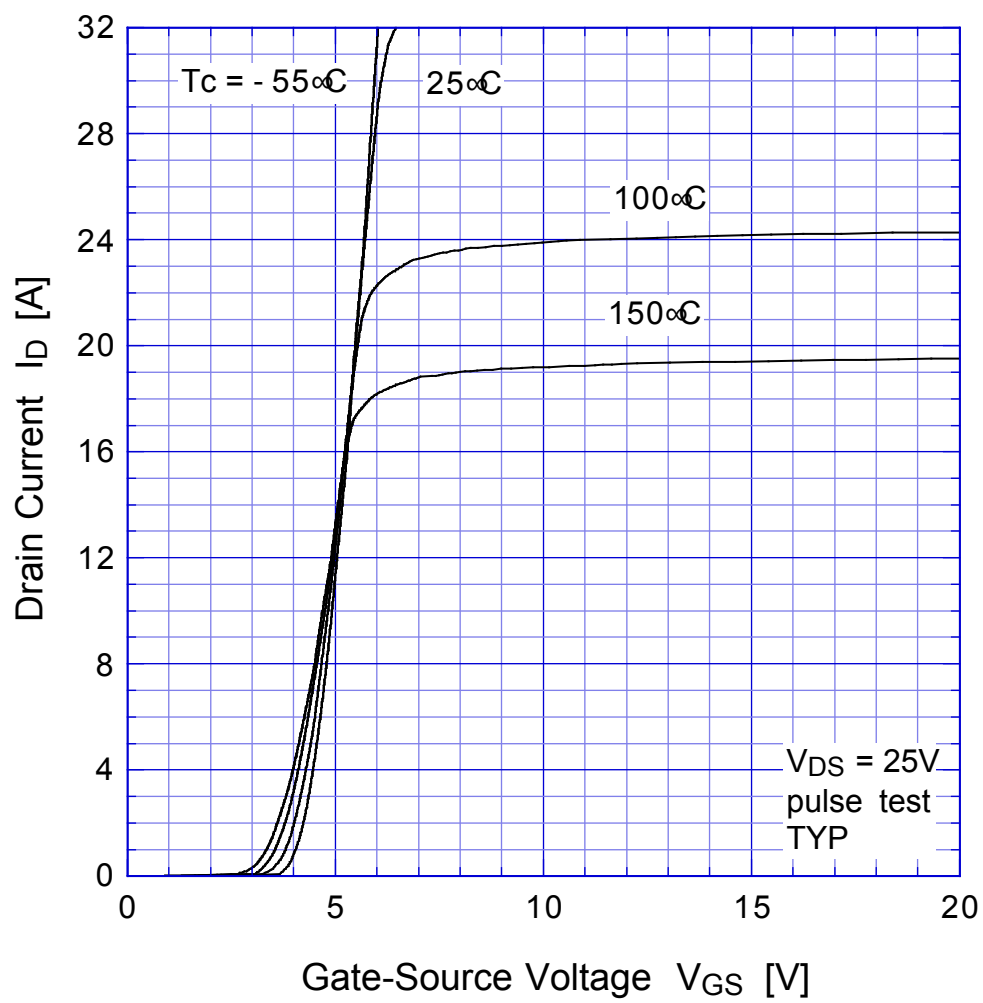
#### ● Absolute Maximum Ratings (Tc = 25°C)

| 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> |                                | 600     | V    |
| Gate-Source Voltage             | V <sub>GSS</sub> |                                | ±30     |      |
| Continuous Drain Current (DC)   | I <sub>D</sub>   |                                | 16      | A    |
| Continuous Drain Current (Peak) | I <sub>DP</sub>  |                                | 48      |      |
| Continuous Source Current (DC)  | I <sub>S</sub>   |                                | 16      |      |
| Total Power Dissipation         | P <sub>T</sub>   |                                | 70      | W    |
| Single Pulse Avalanche Current  | I <sub>AS</sub>  | T <sub>ch</sub> = 25°C         | 16      | A    |
| Dielectric Strength             | V <sub>dis</sub> | Terminals to case, AC 1 minute | 2       | kV   |
| Mounting Torque                 | TOR              | (Recommended torque : 0.5N·m)  | 0.8     | N·m  |

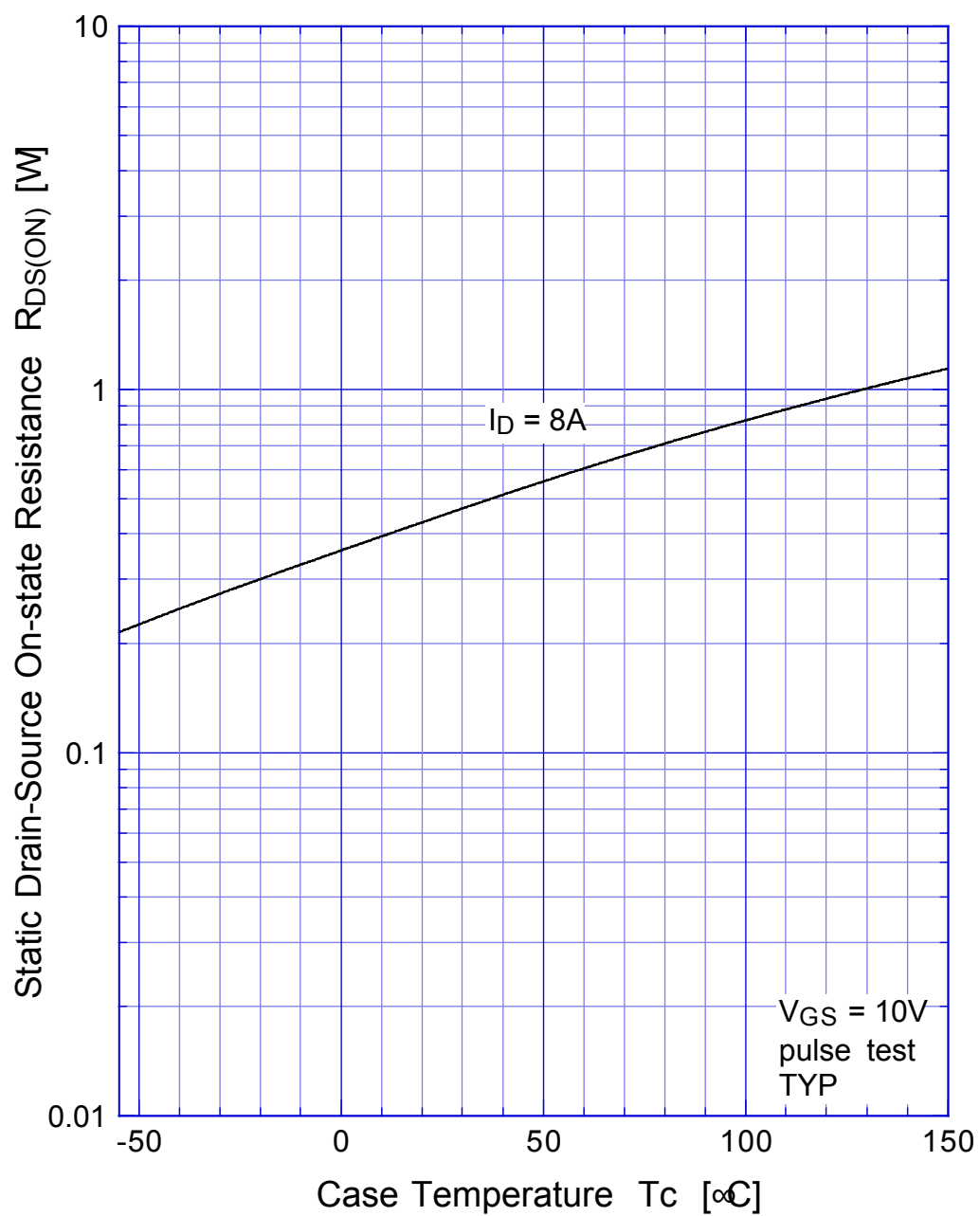
●Electrical Characteristics  $T_c = 25^\circ\text{C}$ 

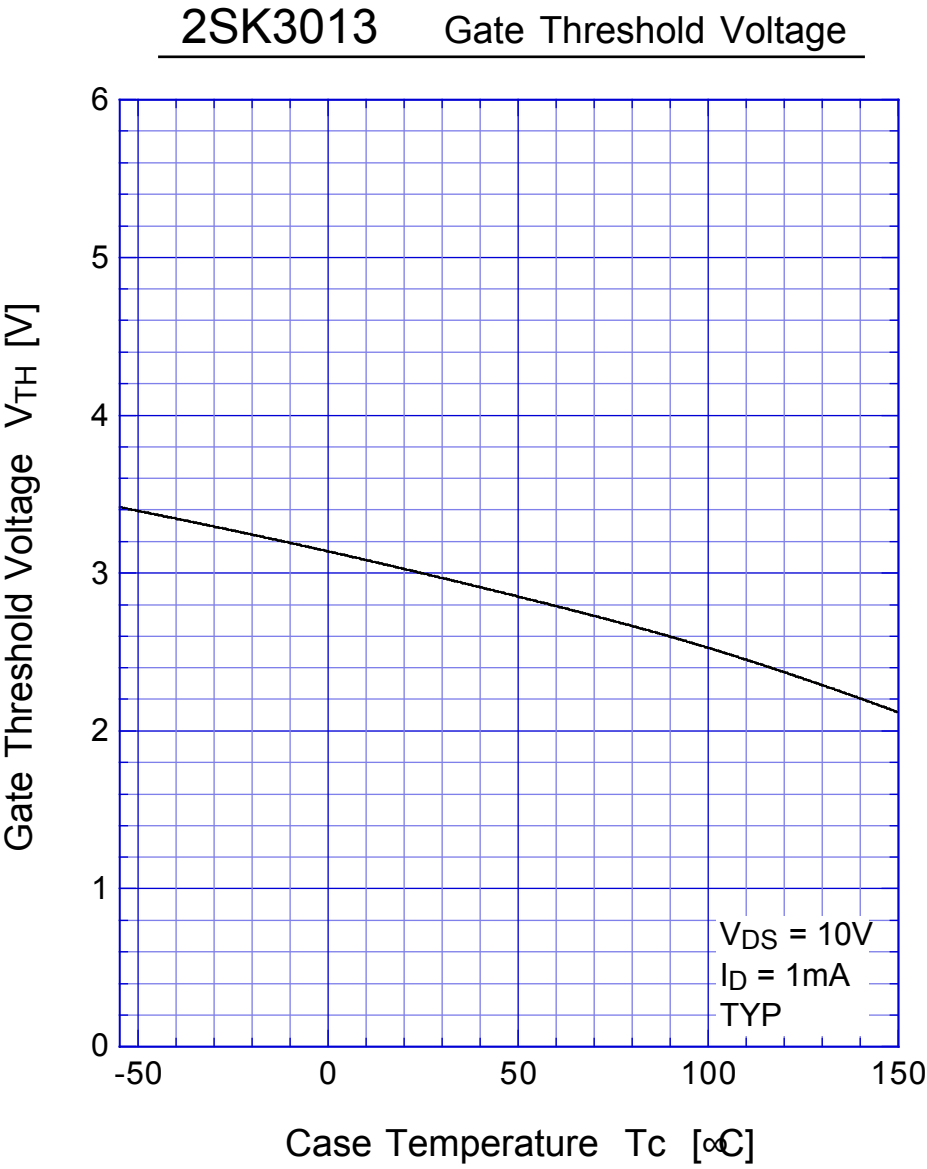
| Item                                    | Symbol        | Conditions                                                          | Min. | Typ. | Max.      | Unit                      |
|-----------------------------------------|---------------|---------------------------------------------------------------------|------|------|-----------|---------------------------|
| Drain-Source Breakdown Voltage          | $V_{(BR)DSS}$ | $I_D = 1\text{mA}$ , $V_{GS} = 0\text{V}$                           | 600  |      |           | V                         |
| Zero Gate Voltage Drain Current         | $I_{DSS}$     | $V_{DS} = 600\text{V}$ , $V_{GS} = 0\text{V}$                       |      |      | 250       | $\mu\text{A}$             |
| Gate-Source Leakage Current             | $I_{GSS}$     | $V_{GS} = \pm 30\text{V}$ , $V_{DS} = 0\text{V}$                    |      |      | $\pm 0.1$ |                           |
| Forward Transconductance                | $g_{fs}$      | $I_D = 8\text{A}$ , $V_{DS} = 10\text{V}$                           | 6.2  | 10.0 |           | S                         |
| Static Drain-Source On-state Resistance | $R_{DS(ON)}$  | $I_D = 8\text{A}$ , $V_{GS} = 10\text{V}$                           |      | 0.45 | 0.6       | $\Omega$                  |
| Gate Threshold Voltage                  | $V_{TH}$      | $I_D = 1\text{mA}$ , $V_{DS} = 10\text{V}$                          | 2.5  | 3    | 3.5       | V                         |
| Source-Drain Diode Forward Voltage      | $V_{SD}$      | $I_S = 8\text{A}$ , $V_{GS} = 0\text{V}$                            |      |      | 1.5       |                           |
| Thermal Resistance                      | $\theta_{jc}$ | junction to case                                                    |      |      | 1.78      | $^\circ\text{C}/\text{W}$ |
| Total Gate Charge                       | $Q_g$         | $V_{GS} = 10\text{V}$ , $I_D = 16\text{A}$ , $V_{DD} = 400\text{V}$ |      | 85   |           | nC                        |
| Input Capacitance                       | $C_{iss}$     | $V_{DS} = 10\text{V}$ , $V_{GS} = 0\text{V}$ , $f = 1\text{MHz}$    |      | 2300 |           | pF                        |
| Reverse Transfer Capacitance            | $C_{rss}$     |                                                                     |      | 180  |           |                           |
| Output Capacitance                      | $C_{oss}$     |                                                                     |      | 480  |           |                           |
| Turn-On Time                            | $t_{on}$      | $I_D = 8\text{A}$ , $V_{GS} = 10\text{V}$ , $R_L = 19\Omega$        |      | 130  | 280       | ns                        |
| Turn-Off Time                           | $t_{off}$     |                                                                     |      | 260  | 500       |                           |

## 2SK3013 Transfer Characteristics

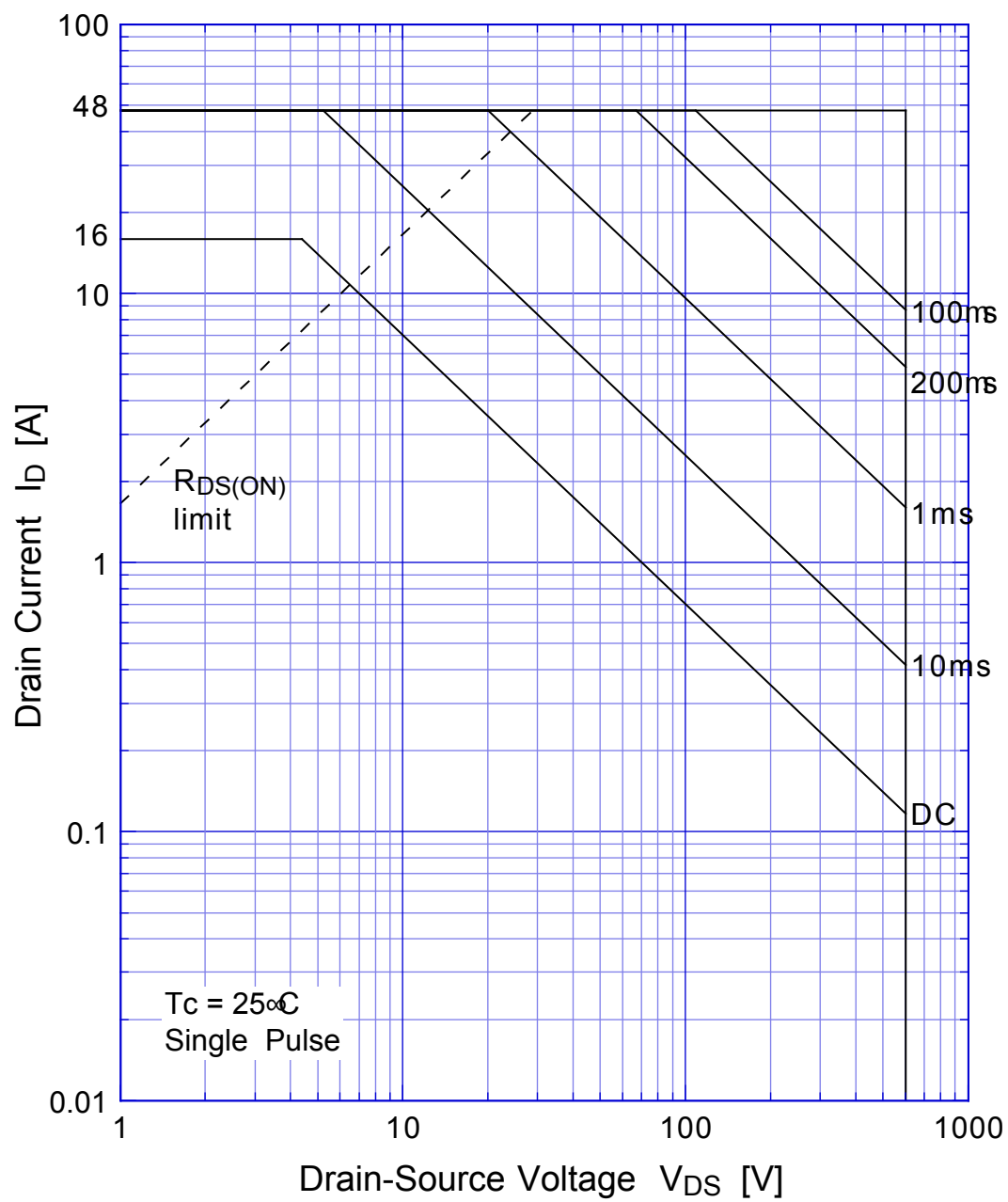


## 2SK3013 Static Drain-Source On-state Resistance

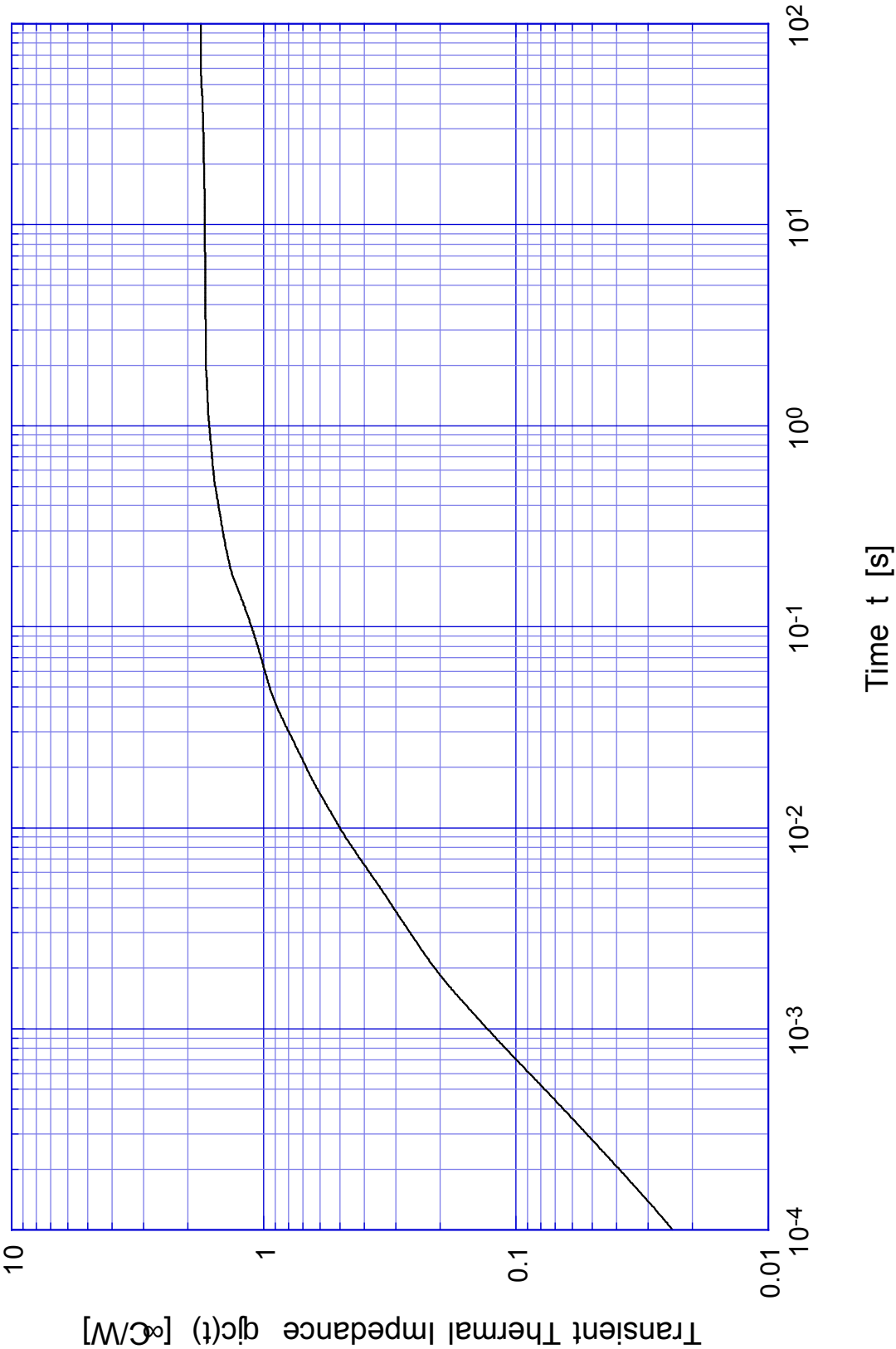




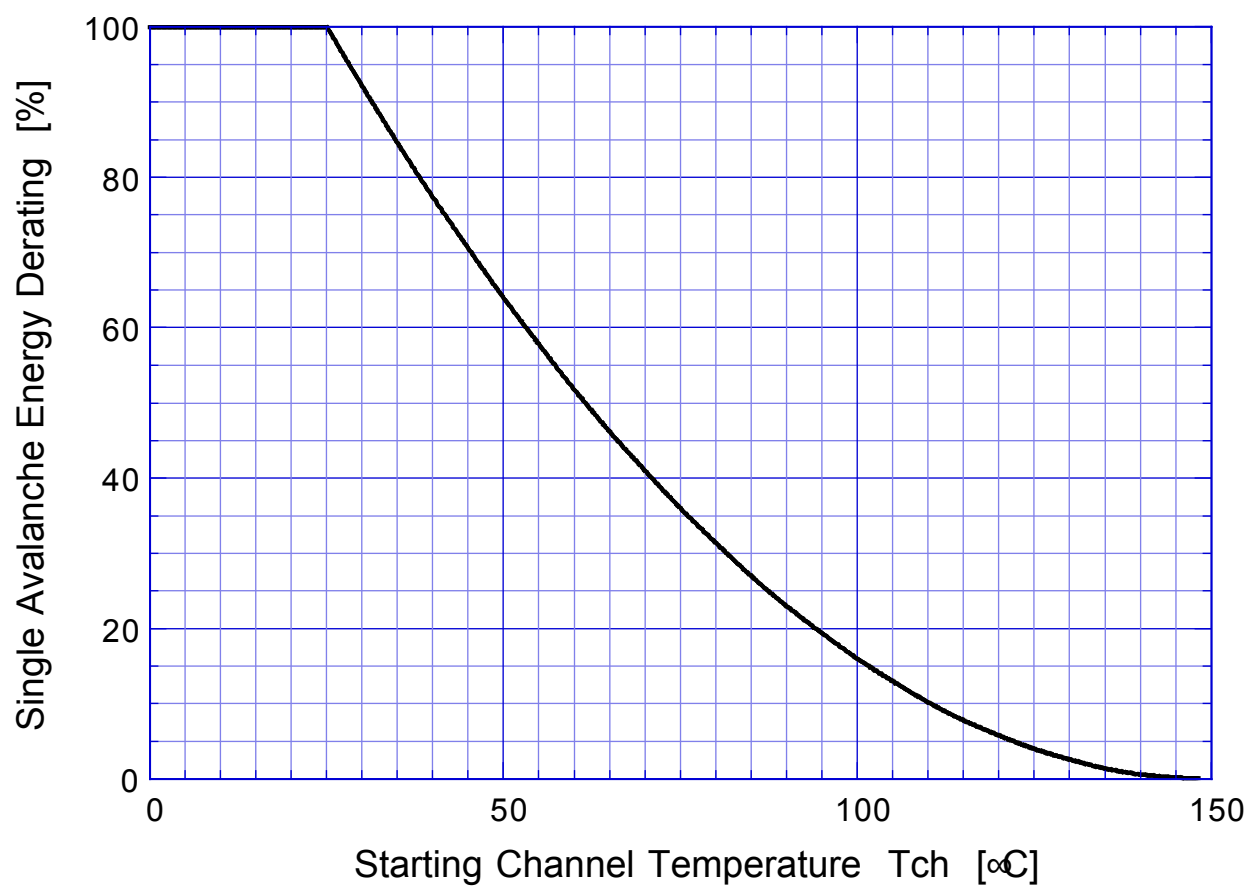
## 2SK3013 Safe Operating Area



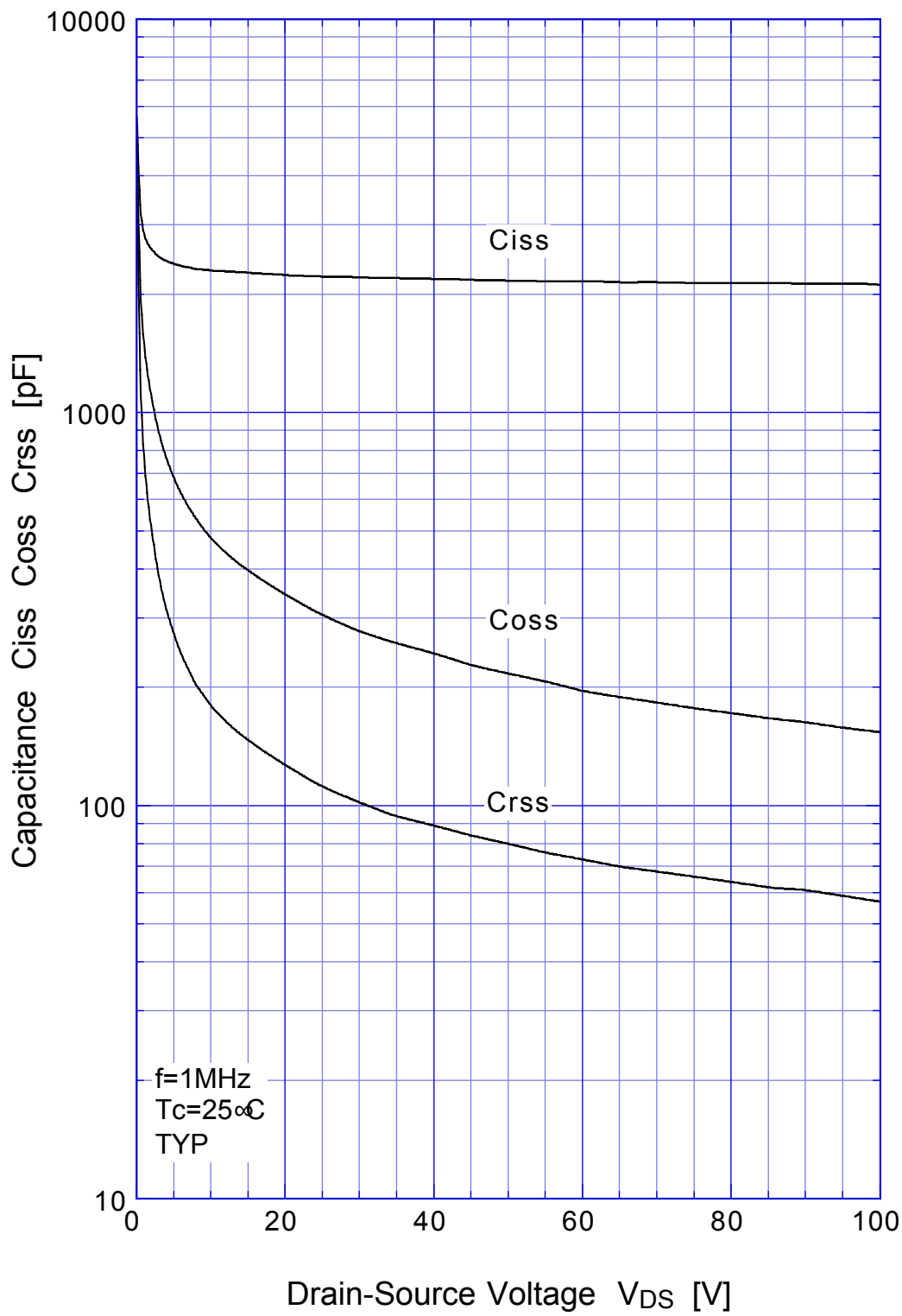
2SK3013      Transient Thermal Impedance



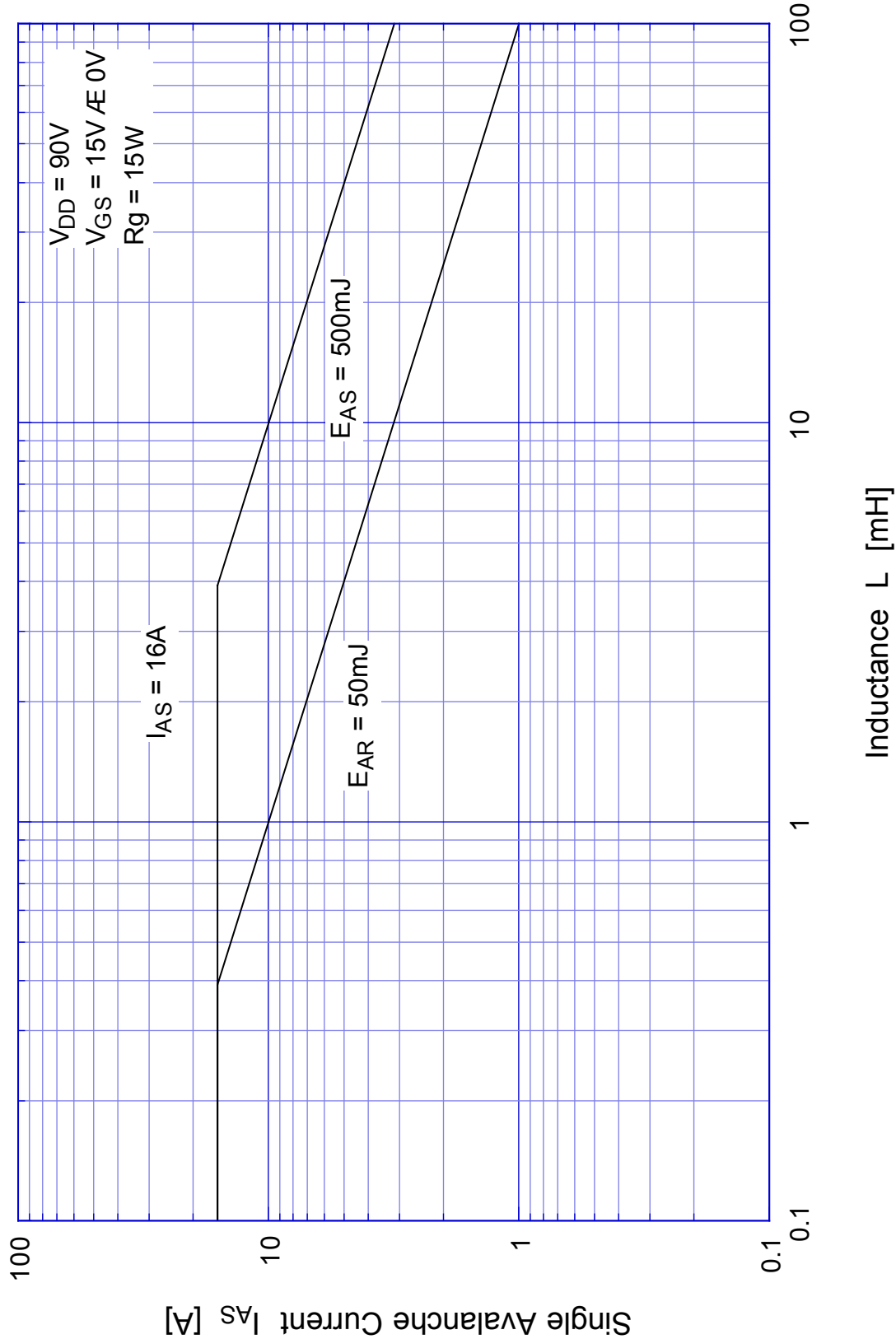
### 2SK3013 Single Avalanche Energy Derating

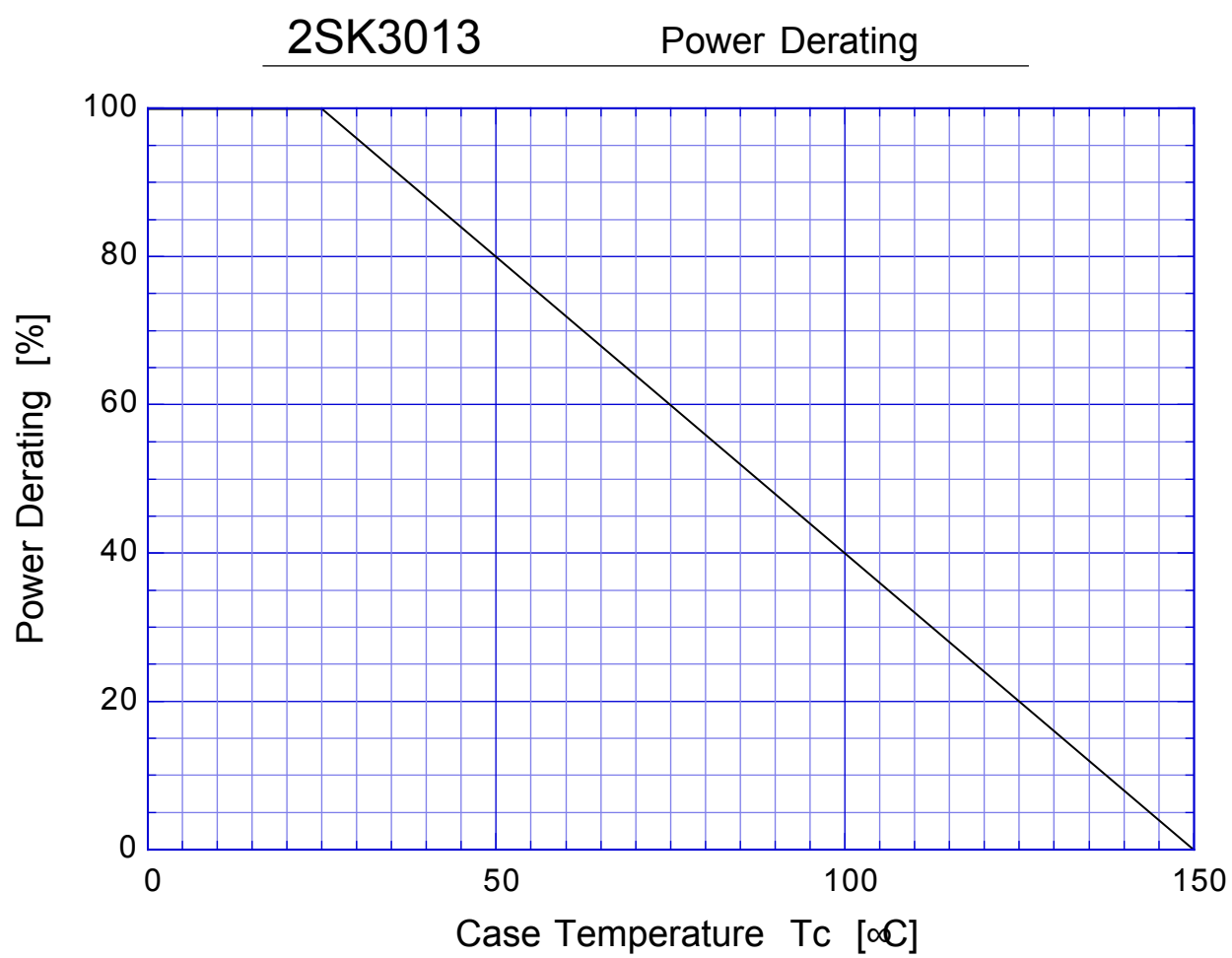


2SK3013      Capacitance



2SK3013 Single Avalanche Current - Inductive Load





2SK3013      Gate Charge Characteristics

