

SPECIFICATION

DEVICE NAME : Power MOSFET

TYPE NAME : 2SK2827-01

SPEC. NO. :

Fuji Electric Co.,Ltd.

This Specification is subject to change without notice.

| | DATE | NAME | APPROVED | Fuji Electric Co.,Ltd. | |
|---------|------|------|----------|------------------------|------|
| DRAWN | | | | DWG. NO. | 1/12 |
| CHECKED | | | | | |
| | | | | | |

- 1.Scope This specifies Fuji Power MOSFET 2SK2827-01
- 2.Construction N-Channel enhancement mode power MOSFET
- 3.Applications for Switching
- 4.Outview TO-220 Outview See to 5/12 page

5.Absolute Maximum Ratings at Tc=25°C (unless otherwise specified)

| Description | Symbol | Characteristics | Unit | Remarks |
|------------------------------|-----------|-----------------|------------------|---------------------------------|
| Drain-Source Voltage | V_{DS} | 600 | V | |
| Continuous Drain Current | I_D | ± 9 | A | |
| Pulsed Drain Current | I_{DP} | ± 32 | A | |
| Gate-Source Voltage | V_{GS} | ± 35 | V | |
| Repetitive or non-repetitive | I_{AV} | 9 | A | $T_{ch} \leq 150^\circ\text{C}$ |
| Maximum Avalanche Energy | E_{AV} | 144.4 | mJ | *1 |
| Maximum Power Dissipation | P_D | 60 | W | |
| Operating and Storage | T_{ch} | 150 | $^\circ\text{C}$ | |
| Temperature range | T_{stg} | -55 to +150 | $^\circ\text{C}$ | |

*1 L=3.27mH, Vcc=60V

6.Electrical Characteristics at Tc=25°C (unless otherwise specified)

Static Ratings

| Description | Symbol | Conditions | min. | typ. | max. | Unit |
|-------------------------------------|--------------|---|------|------|------|---------------|
| Drain-Source Breakdown Voltage | BV_{DSS} | $I_D=1\text{mA}$ $V_{GS}=0\text{V}$ | 600 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $I_D=1\text{mA}$ $V_{DS}=V_{GS}$ | 3.5 | 4.0 | 4.5 | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=600\text{V}$ $V_{GS}=0\text{V}$ $T_{ch}=25^\circ\text{C}$ | | 10 | 500 | μA |
| | | $T_{ch}=125^\circ\text{C}$ | | 0.2 | 1.0 | mA |
| Gate-Source Leakage Current | I_{GSS} | $V_{GS}=\pm 35\text{V}$ $V_{DS}=0\text{V}$ | | 10 | 100 | nA |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $I_D=4.5\text{A}$ $V_{GS}=10\text{V}$ | | 1.0 | 1.2 | Ω |

Dynamic Ratings

| Description | Symbol | Conditions | min. | typ. | max. | Unit |
|------------------------------|------------|----------------------------|------|------|------|------|
| Forward Transconductance | g_{fs} | $I_D=4.5A$ $V_{DS}=25V$ | 2.5 | 5.0 | | S |
| Input Capacitance | C_{iss} | $V_{DS}=25V$ | | 900 | 1400 | pF |
| Output Capacitance | C_{oss} | $V_{GS}=0V$ | | 150 | 230 | |
| Reverse Transfer Capacitance | C_{rss} | $f=1MHz$ | | 70 | 110 | |
| Turn-On Time | $t_d(on)$ | $V_{cc}=300V$ | | 25 | 40 | ns |
| | t_r | $V_{GS}=10V$ | | 70 | 110 | |
| Turn-Off Time | $t_d(off)$ | $I_D=9A$ | | 60 | 90 | |
| | t_f | $R_{GS}=10\Omega$ | | 35 | 60 | |

Reverse Diode

| Description | Symbol | Conditions | min. | typ. | max. | Unit |
|--------------------------|----------|--|------|------|------|---------|
| Avalanche Capability | I_{AV} | $L=3.27mH$ $T_{ch}=25^\circ C$ See Fig.1 and Fig.2 | 9 | | | A |
| Diode Forward On-Voltage | V_{SD} | $I_F=2 \times I_{DR}$ $V_{GS}=0V$ $T_{ch}=25^\circ C$ | | 1.0 | 1.5 | V |
| Reverse Recovery Time | t_{rr} | $I_F=2 \times I_{DR}$ | | 550 | | ns |
| Reverse Recovery Charge | Q_{rr} | $-di/dt=100A/\mu s$ $T_{ch}=25^\circ C$ | | 7 | | μc |

7. Thermal Resistance

| Description | Symbol | min. | typ. | max. | Unit |
|--------------------|----------------|------|------|------|--------------|
| Channel to Case | $R_{th}(ch-c)$ | | | 2.08 | $^\circ C/W$ |
| Channel to Ambient | $R_{th}(ch-a)$ | | | 75.0 | $^\circ C/W$ |

Fig.1 Test Circuit

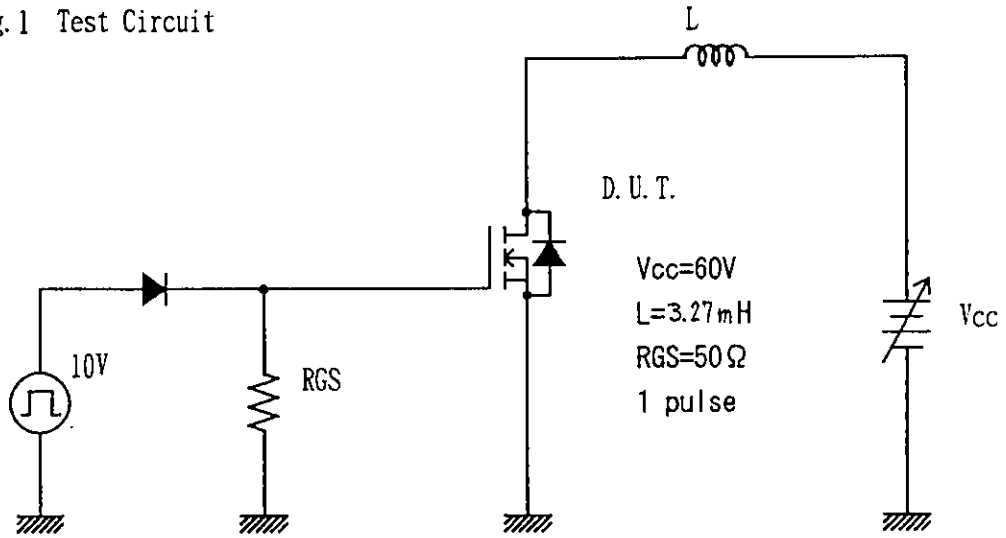
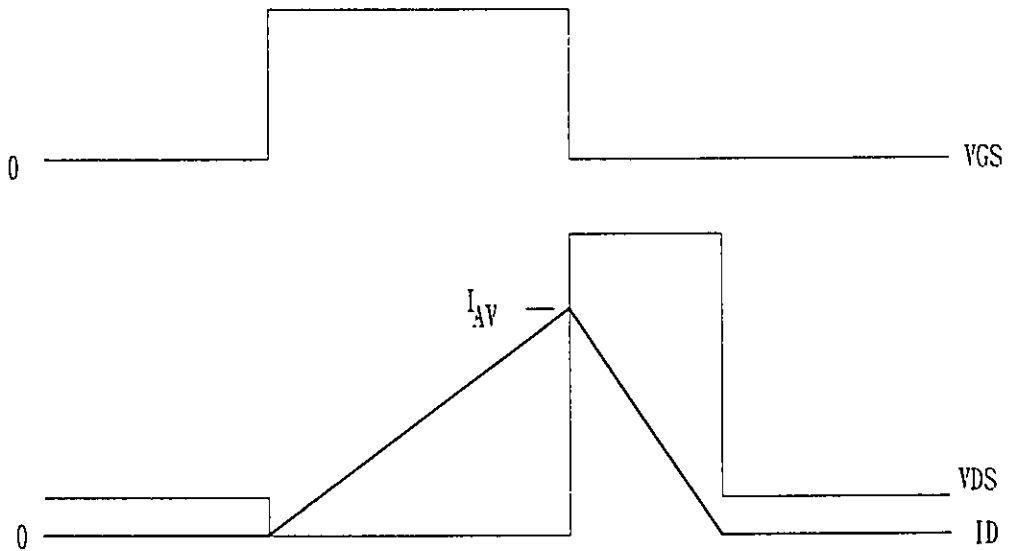
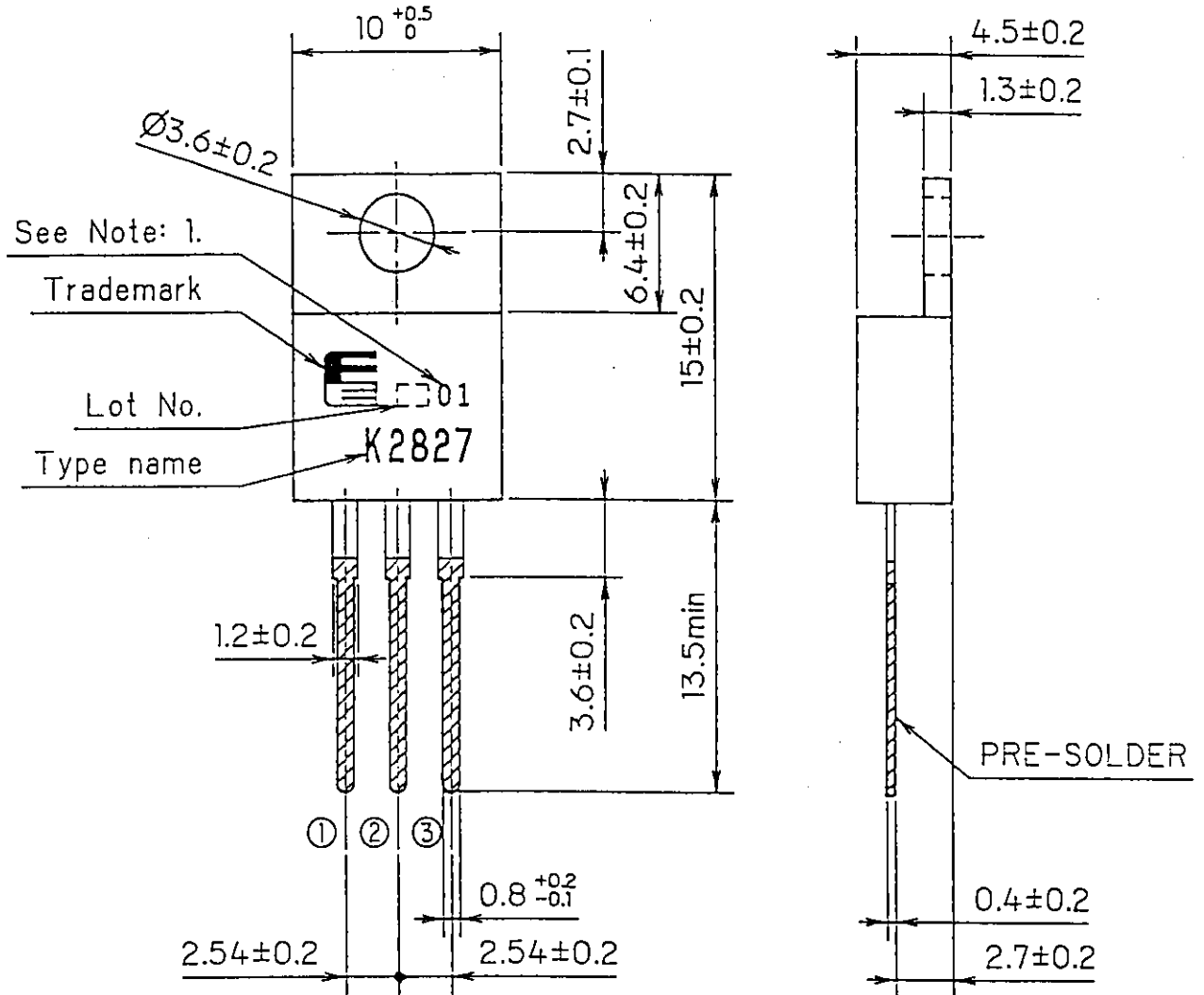


Fig.2 Operating waveforms



FUJI POWER MOS FET

TYPE : 2SK2827-01



CONNECTION



① ② ③

- ① GATE
- ② DRAIN
- ③ SOURCE

JEDEC : TO-220AB

Note: 1. Guaranteed mark of avalanche ruggedness.

DIMENSIONS ARE IN MILLIMETERS.

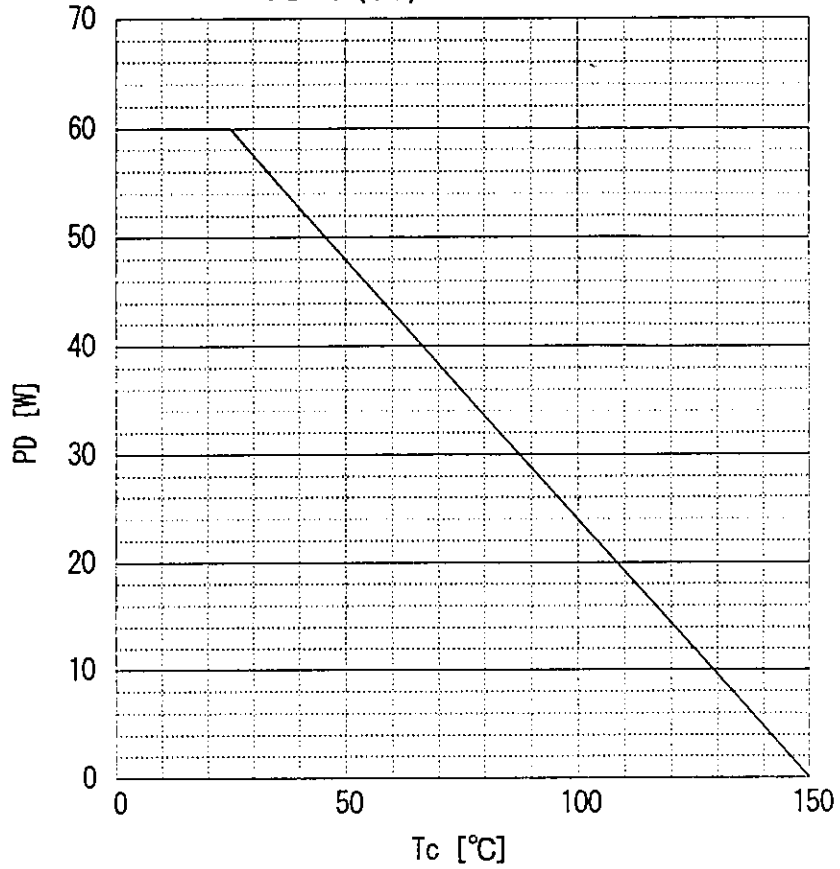
Fuji Electric Co., Ltd.

DWG. NO.

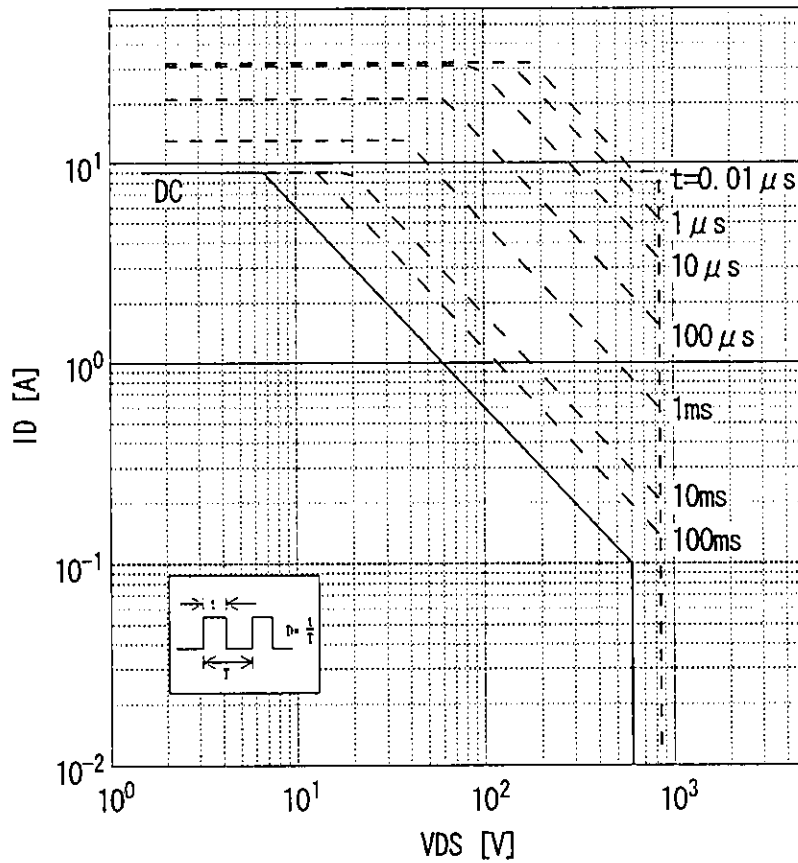
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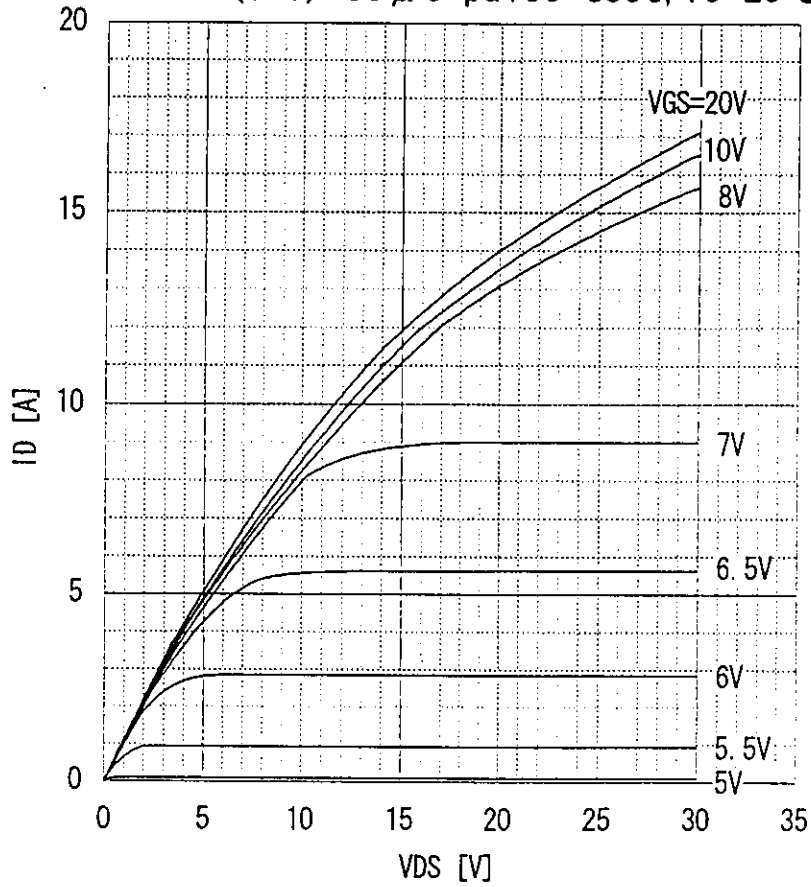
Power Dissipation
 $PD=f(T_c)$



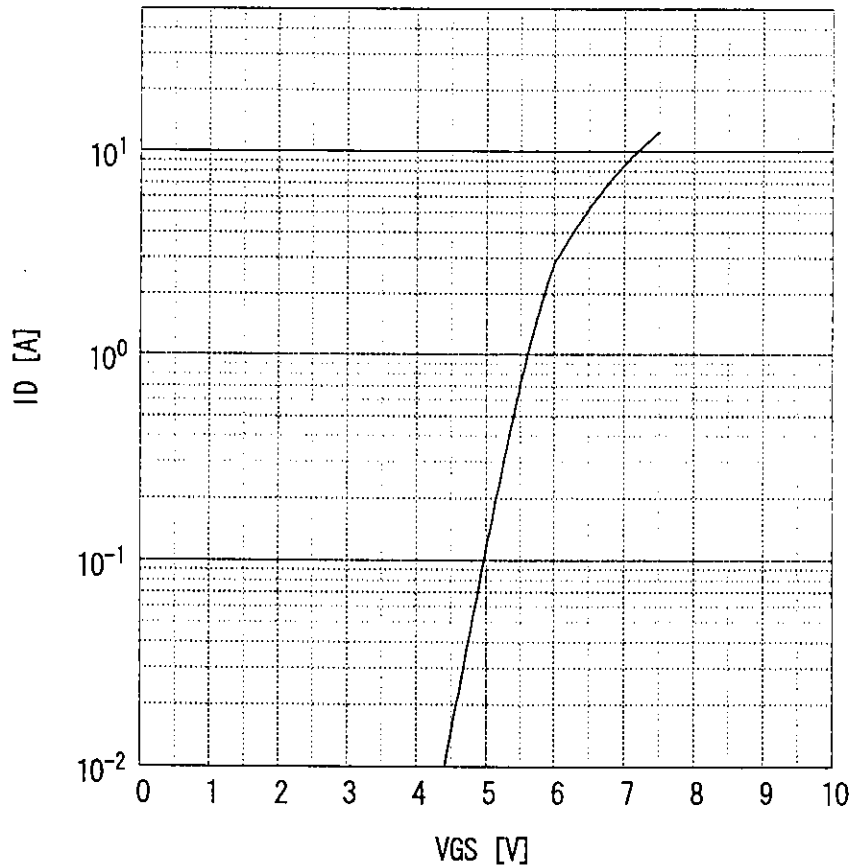
Safe operating area
 $ID=f(V_{DS}) : D=0.01, T_c=25^\circ C$



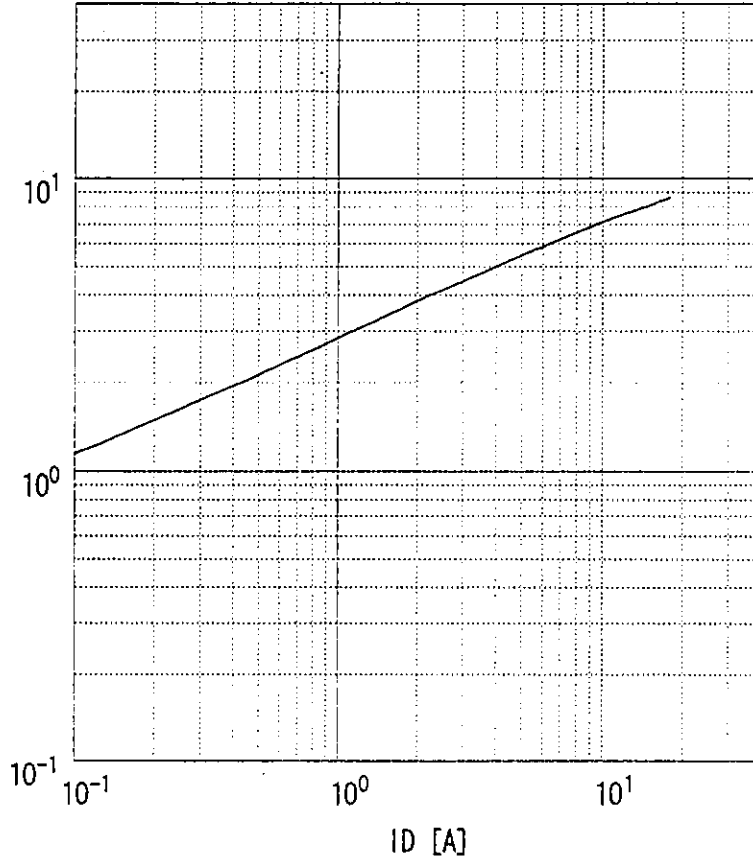
Typical output characteristics
 $I_D = f(V_{DS}) : 80 \mu s$ pulse test, $T_c = 25^\circ C$



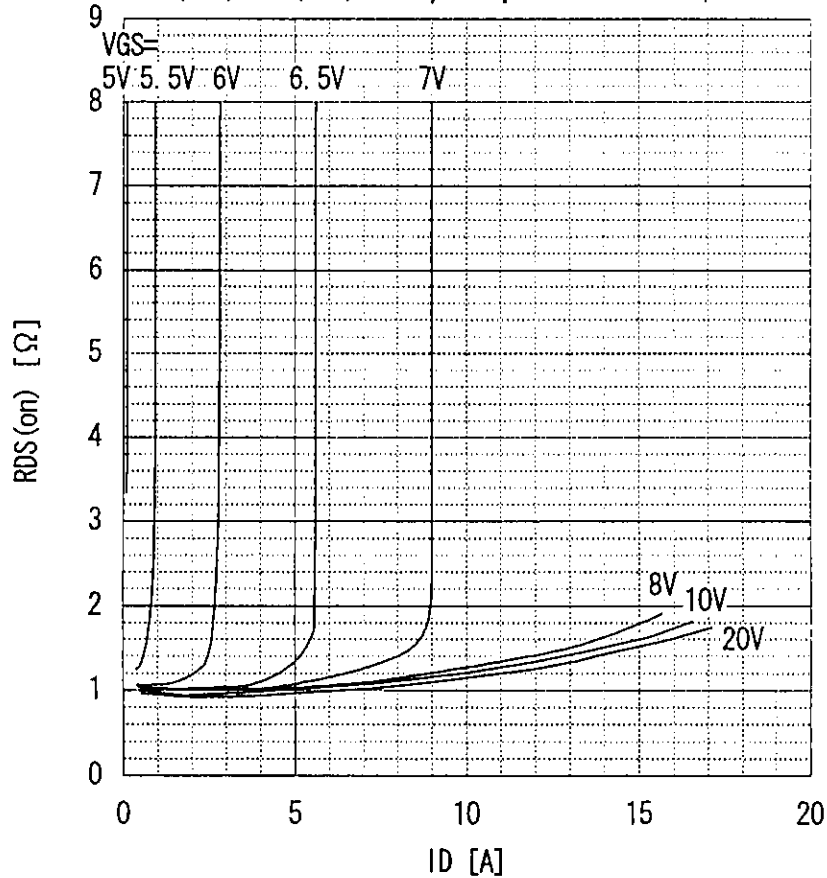
Typical transfer characteristic
 $I_D = f(V_{GS}) : 80 \mu s$ pulse test, $V_{DS} = 25V$, $T_{ch} = 25^\circ C$



Typical forward transconductance
 $g_{fs}=f(I_D)$: 80 μ s pulse test, $V_{DS}=25V$, $T_{ch}=25^\circ C$

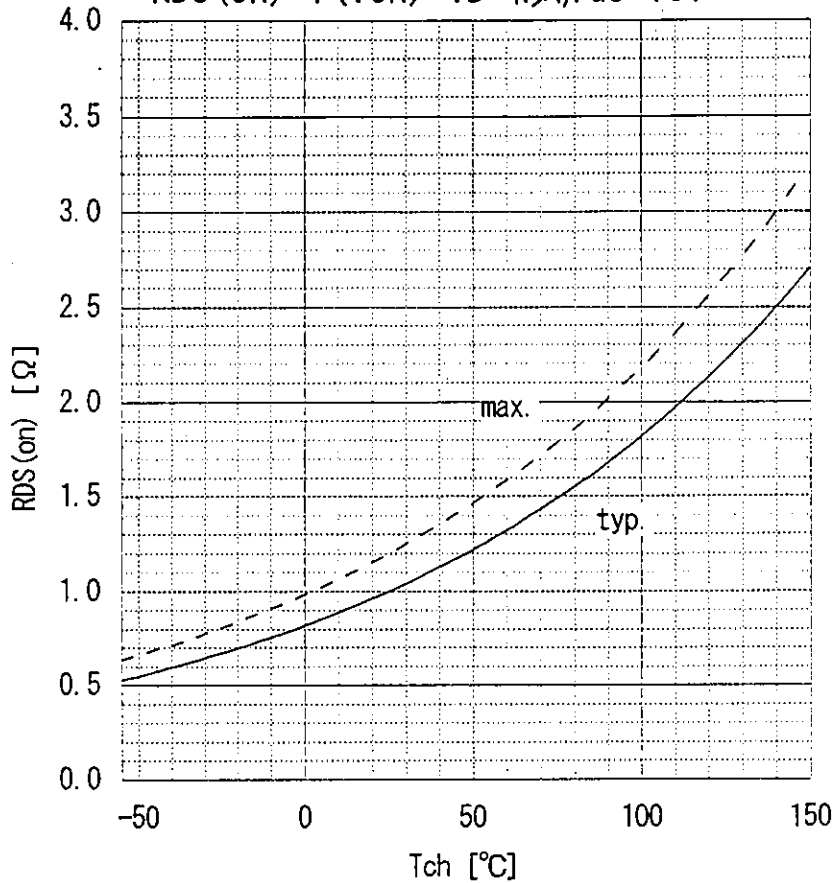


Typical drain-source on-state resistance
 $R_{DS(on)}=f(I_D)$: 80 μ s pulse test, $T_c=25^\circ C$



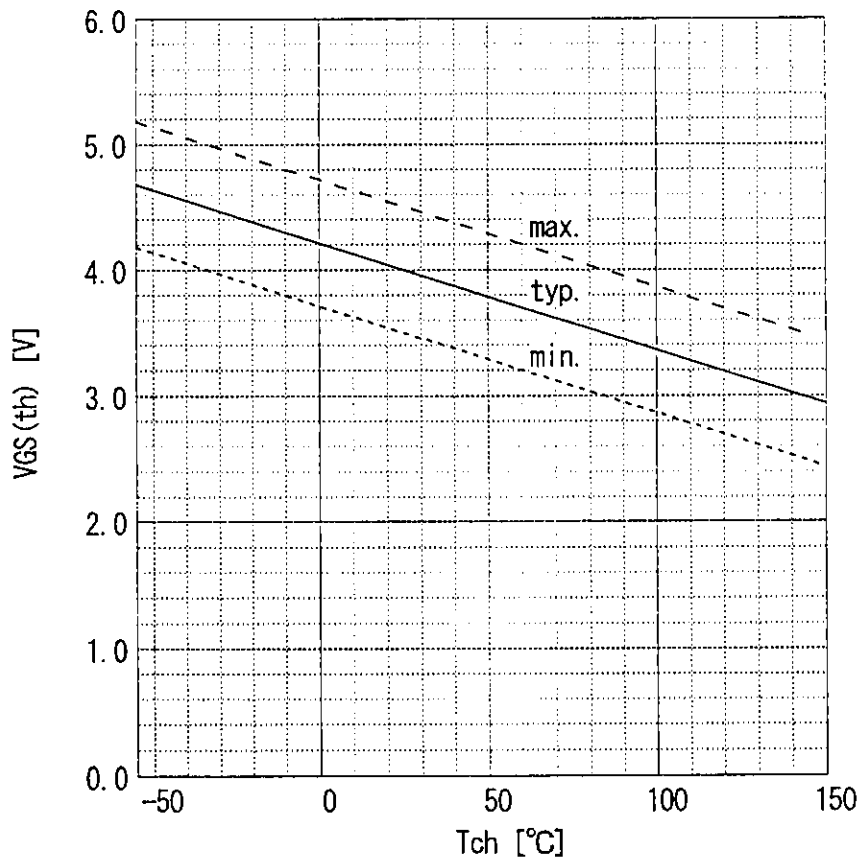
Drain-source on-state resistance

$R_{DS(on)} = f(T_{ch}) : I_D = 4.5A, V_{GS} = 10V$

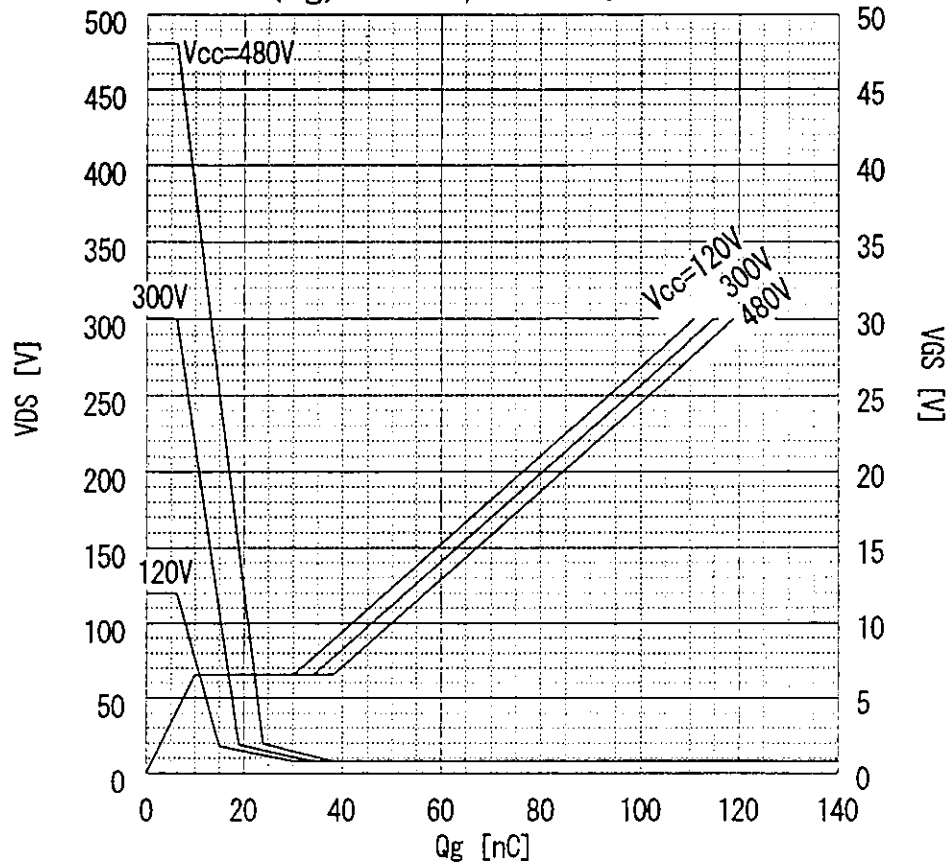


Gate threshold voltage

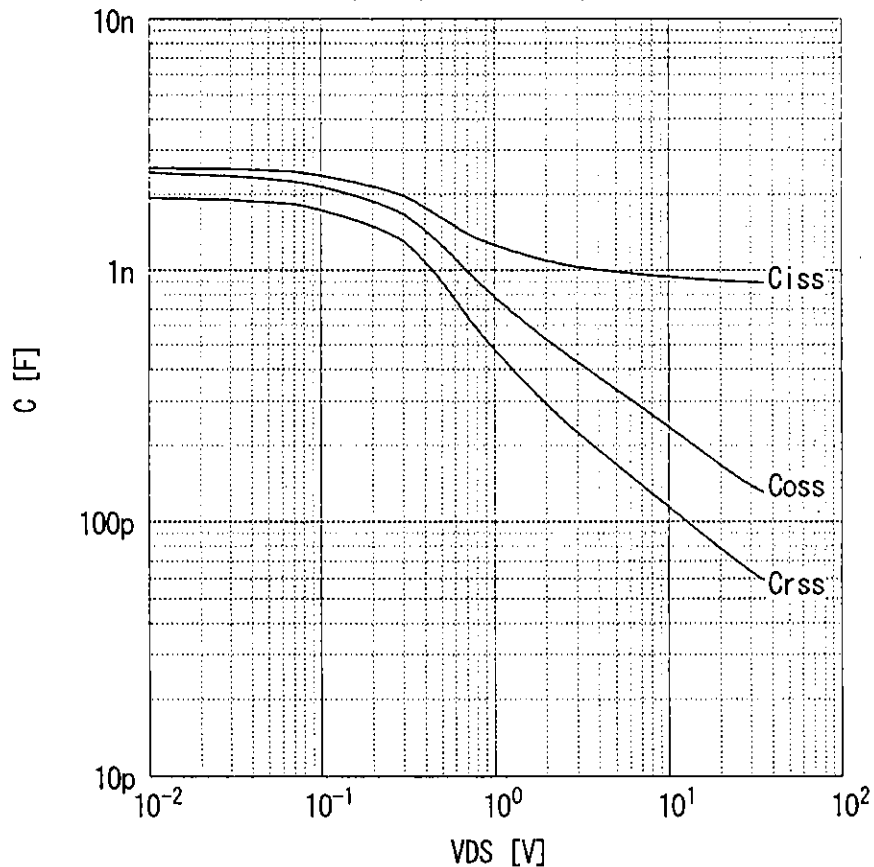
$V_{GS(th)} = f(T_{ch}) : I_D = 1mA, V_{DS} = V_{GS}$



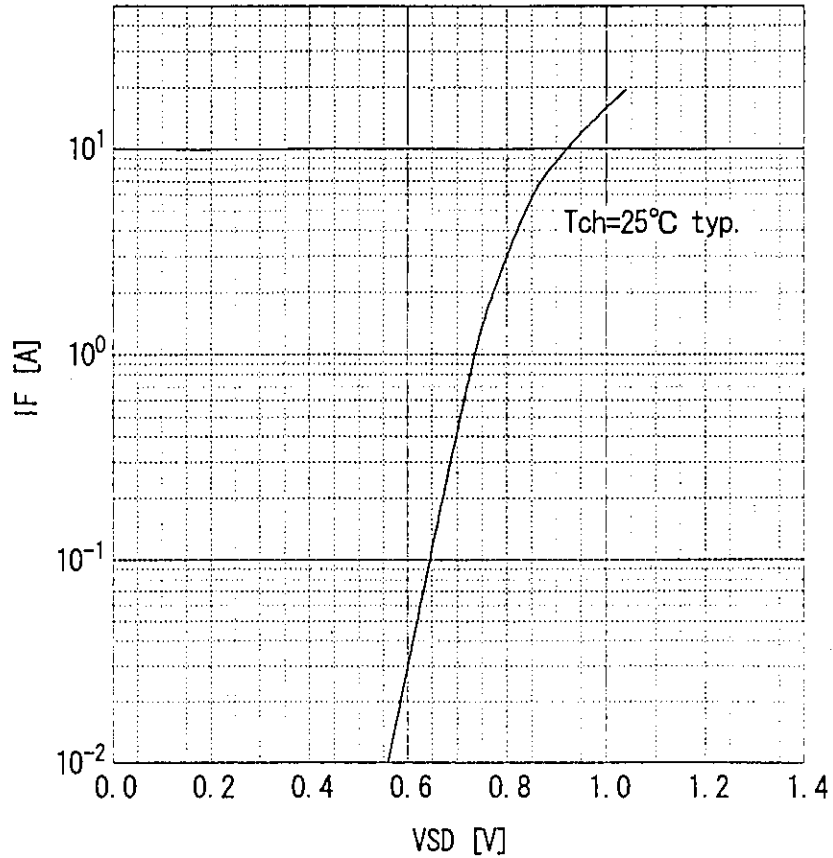
Typical gate charge characteristic
 $V_{GS} = f(Q_g) : I_D = 9A, T_c = 25^\circ C$



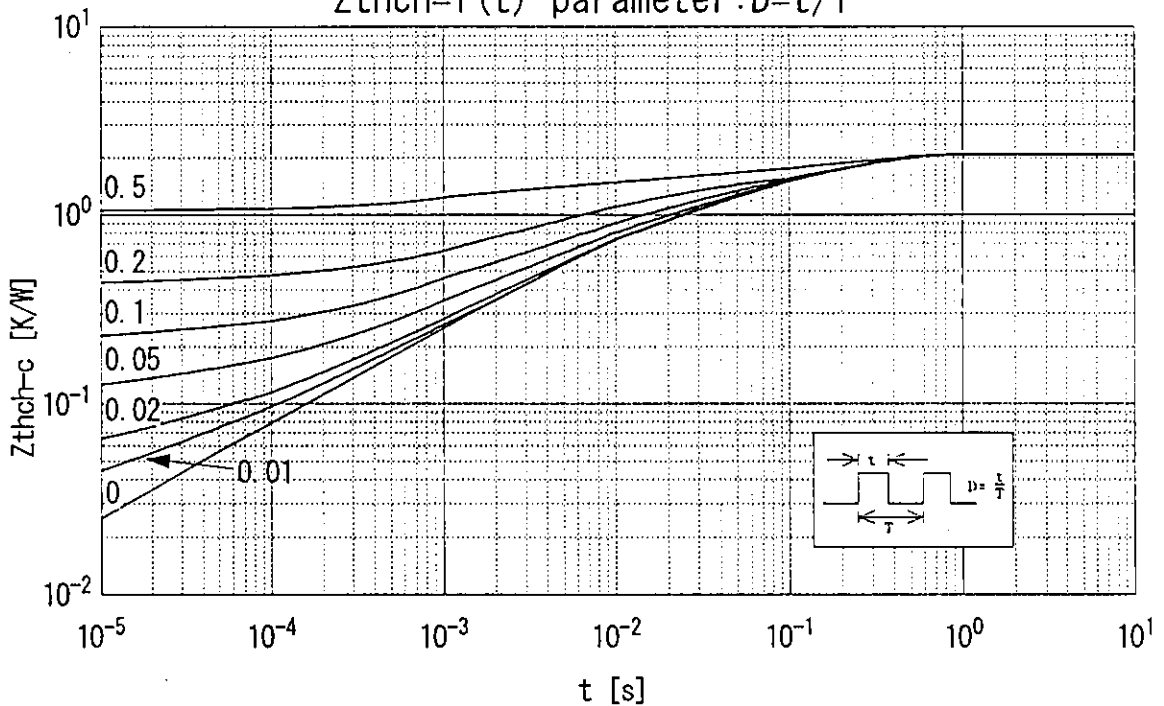
Typical capacitances
 $C = f(V_{DS}) : V_{GS} = 0V, f = 1MHz$



Forward characteristic of reverse of diode
 $I_F = f(V_{SD}) : 80 \mu s$ pulses test, $V_{GS} = 0V$



Transient thermal impedance
 $Z_{thch} = f(t)$ parameter: $D = t/T$



Avalanche energy derating
 $E_{as}=f(\text{starting } T_{ch}) : V_{CC}=60V, I_{AV}=9A$

