

# SPECIFICATION

DEVICE NAME : Power MOSFET

TYPE NAME : 2SK2072-01L, S

SPEC. No. :

Fuji Electric Co.,Ltd.

This Specification is subject to change without notice.

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

1. Scope  
This specifies Fuji power MOSFET 2SK2072-01L, S
2. Construction N-channel enhancement mode power MOSFET
3. Application for switching
4. Outview T-pack L-type : See to 5/12 page  
S-type : See to 6/12 page
5. Absolute maximum ratings at  $T_c=25^\circ\text{C}$  (unless otherwise specified)

| Description                             | Symbol                | Characteristics   | Unit                                 | Remarks                   |
|-----------------------------------------|-----------------------|-------------------|--------------------------------------|---------------------------|
| Drain-source voltage                    | $V_{DS}$              | 800               | V                                    |                           |
| Drain-gate voltage                      | $V_{DGR}$             | 800               | V                                    | $R_{GS}=20\text{K}\Omega$ |
| Continuous Drain current                | $I_D$                 | $\pm 6$           | A                                    |                           |
| Pulsed drain current                    | $I_{Dpul}$            | $\pm 24$          | A                                    |                           |
| Gate-source voltage                     | $V_{GS}$              | $\pm 30$          | V                                    |                           |
| Maximum power dissipation               | $P_D$                 | 80                | W                                    |                           |
| Operating and storage temperature range | $T_{ch}$<br>$T_{stg}$ | 150<br>-55 ~ +150 | $^\circ\text{C}$<br>$^\circ\text{C}$ |                           |

6. Electrical characteristics at  $T_c=25^\circ\text{C}$  (unless otherwise specified)  
Static ratings

| Description                      | Symbol       | Conditions                                                              | Characteristics |      |      | Unit          |
|----------------------------------|--------------|-------------------------------------------------------------------------|-----------------|------|------|---------------|
|                                  |              |                                                                         | Min.            | Typ. | Max. |               |
| Drain-source breakdown voltage   | $BV_{DSS}$   | $I_D=1\text{mA}$<br>$V_{GS}=0\text{V}$                                  | 800             |      |      | V             |
| Gate threshold voltage           | $V_{GS(th)}$ | $I_D=1\text{mA}$<br>$V_{DS}=V_{GS}$                                     | 2.5             | 3.0  | 3.5  | V             |
| Zero gate voltage drain current  | $I_{DSS}$    | $V_{DS}=800\text{V}$<br>$V_{GS}=0\text{V}$<br>$T_{ch}=25^\circ\text{C}$ |                 | 10   | 500  | $\mu\text{A}$ |
|                                  | $I_{DSS}$    | $T_{ch}=125^\circ\text{C}$                                              |                 | 0.2  | 1.0  | mA            |
| Gate-source leakage current      | $I_{GSS}$    | $V_{GS}=\pm 30\text{V}$<br>$V_{DS}=0\text{V}$                           |                 | 10   | 100  | nA            |
| Drain-source on-state resistance | $R_{DS(on)}$ | $I_D=3\text{A}$<br>$V_{GS}=10\text{V}$                                  |                 | 1.7  | 2.1  | $\Omega$      |

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# Dynamic ratings

| Description                  | Symbol       | Conditions                                                             | Characteristics |      |      | Unit |
|------------------------------|--------------|------------------------------------------------------------------------|-----------------|------|------|------|
|                              |              |                                                                        | Min.            | Typ. | Max. |      |
| Forward transconductance     | $g_{fs}$     | $I_D = 3A$<br>$V_{DS} = 25V$                                           | 3.0             | 6.5  |      | S    |
| Input capacitance            | $C_{iss}$    | $V_{DS} = 25V$<br>$V_{GS} = 0V$<br>$f = 1MHz$                          |                 | 1200 | 1800 | pF   |
| Output capacitance           | $C_{oss}$    |                                                                        |                 | 120  | 180  | pF   |
| Reverse transfer capacitance | $C_{rss}$    |                                                                        |                 | 40   | 60   | pF   |
| Turn-on time                 | $t_{d(on)}$  | $V_{CC} = 600V$<br>$V_{GS} = 10V$<br>$I_D = 5A$<br>$R_{GS} = 10\Omega$ |                 | 25   | 40   | ns   |
|                              | $t_r$        |                                                                        |                 | 25   | 40   | ns   |
| Turn-off time                | $t_{d(off)}$ |                                                                        |                 | 85   | 130  | ns   |
|                              | $t_f$        |                                                                        |                 | 45   | 70   | ns   |

# Reverse diode

| Description              | Symbol   | Conditions                                                                          | Characteristics |      |      | Unit    |
|--------------------------|----------|-------------------------------------------------------------------------------------|-----------------|------|------|---------|
|                          |          |                                                                                     | Min.            | Typ. | Max. |         |
| Avalanche capability     | $I_{AV}$ | $L = 100\mu H$ , $T_{ch} = 25^\circ C$<br>* See Fig1 & 2                            | 6               |      |      | A       |
| Diode forward on-voltage | $V_{SD}$ | $I_F = 2 \times I_{DR}$<br>$V_{GS} = 0V$ , $T_{ch} = 25^\circ C$                    |                 | 1.10 | 1.60 | V       |
| Reverse recovery time    | $t_{rr}$ | $I_F = I_{DR}$<br>$V_{GS} = 0V$<br>$-di_F/dt = 100A/\mu s$<br>$T_{ch} = 25^\circ C$ |                 |      |      | ns      |
| Reverse recovery charge  | $Q_{rr}$ |                                                                                     |                 |      |      | $\mu C$ |

# 7. Thermal resistance

| Description        | Symbol          | Conditions | Characteristics |      |      | Unit         |
|--------------------|-----------------|------------|-----------------|------|------|--------------|
|                    |                 |            | Min.            | Typ. | Max. |              |
| Thermal resistance | $R_{th_{ch-c}}$ |            |                 |      | 1.56 | $^\circ C/W$ |
|                    | $R_{th_{ch-a}}$ |            |                 |      | 125  | $^\circ C/W$ |

Fig.1 Test circuit

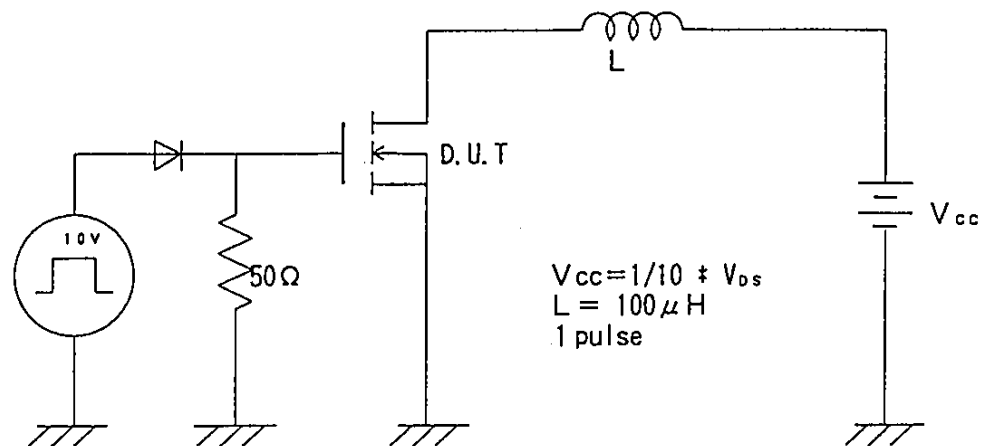
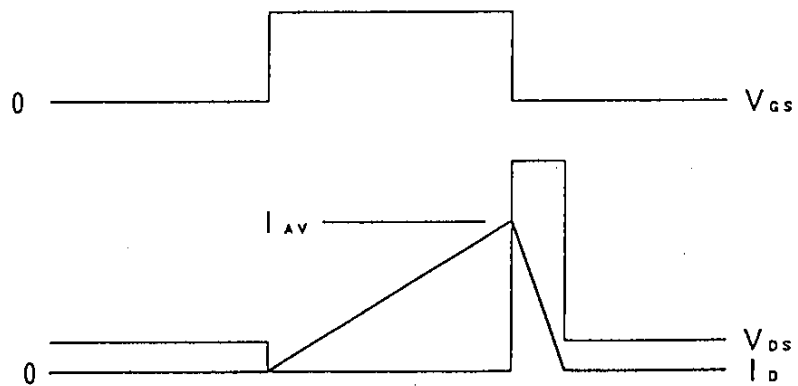
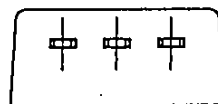
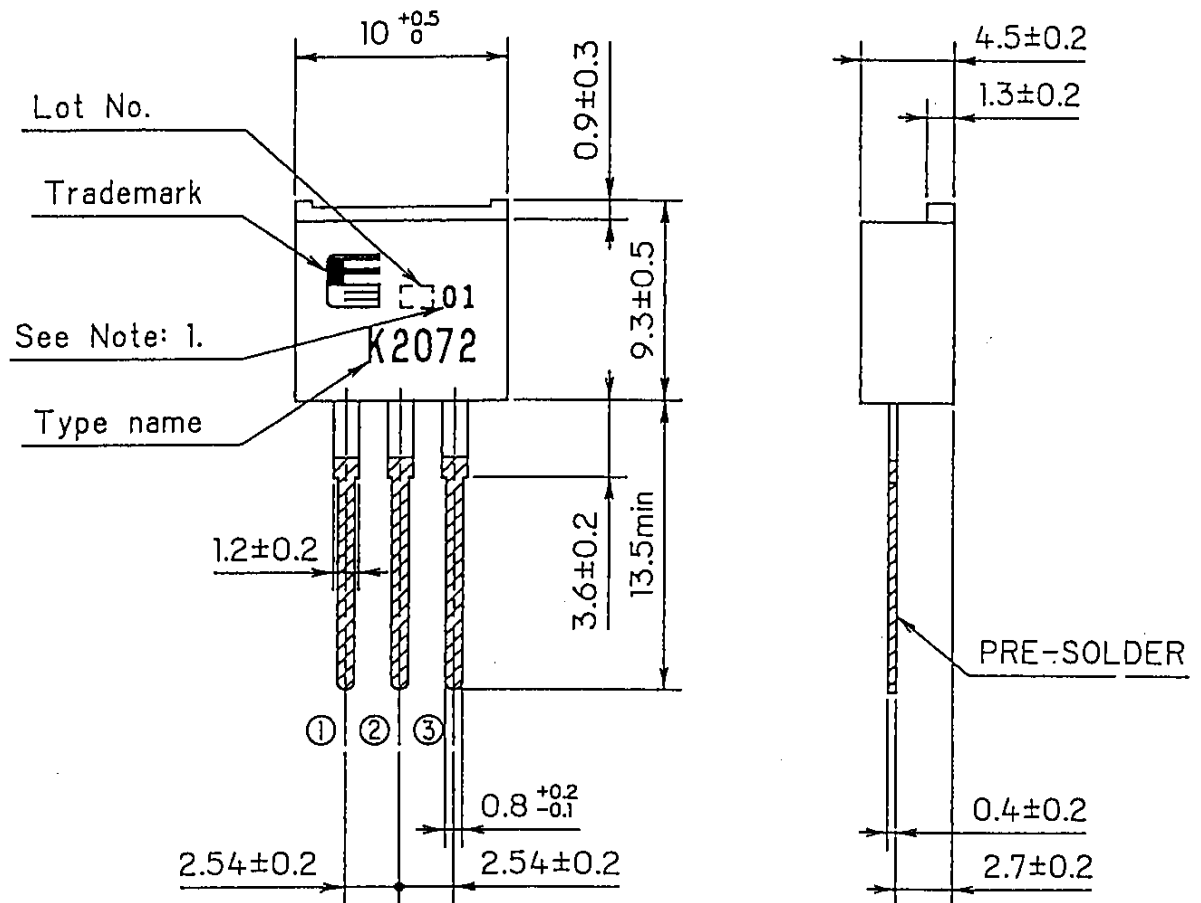


Fig.2 Operating waveforms



# FUJI POWER MOS FET

TYPE : 2SK2072-01L



① ② ③

## CONNECTION

- ① GATE
- ② DRAIN
- ③ SOURCE

Note: 1. Guaranteed mark of avalanche ruggedness.

DIMENSIONS ARE IN MILLIMETERS.

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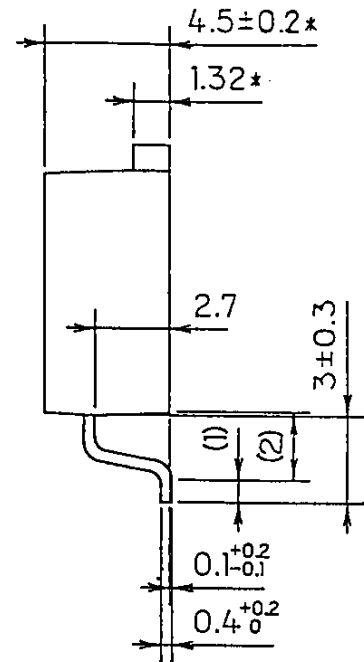
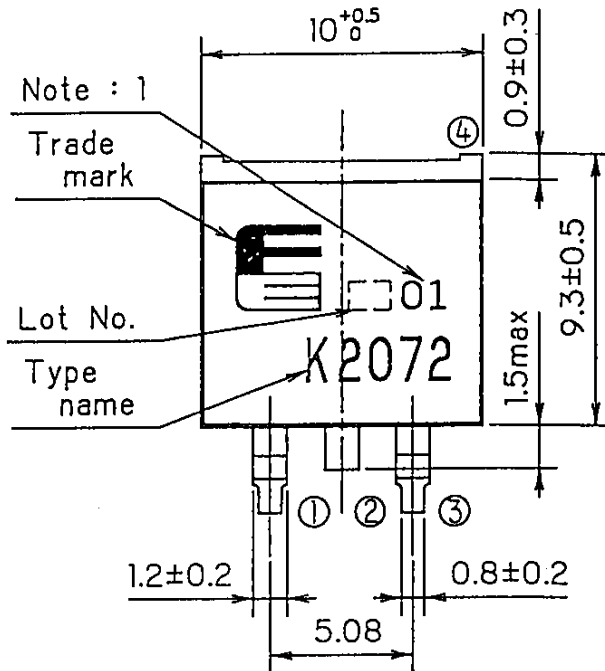
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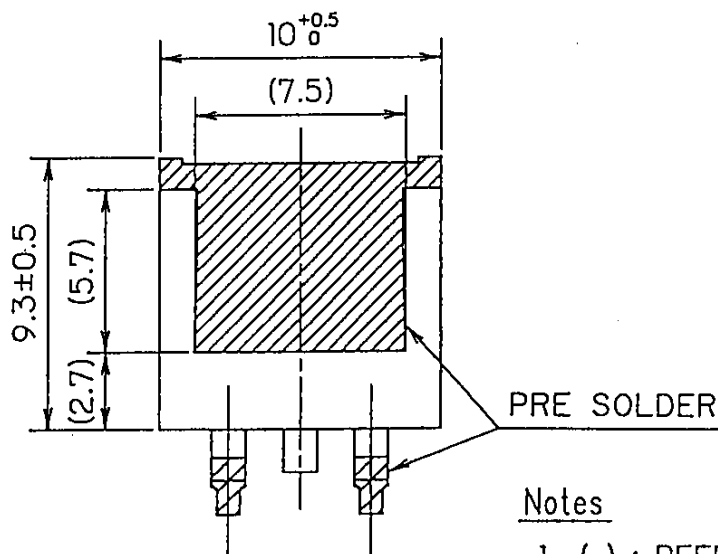
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# FUJI POWER MOS FET

TYPE : 2SK2072-01S



## BOTTOM VIEW



## CONNECTION

- ① GATE
- ④ ② DRAIN
- ③ SOURCE

## Notes

1. ( ) : REFERENCE DIMENSIONS.
  2. \* : DO NOT INCLUDE SOLDER.
- Note 1. Guaranteed mark of avalanche ruggedness.

DIMENSIONS ARE IN MILLIMETERS.

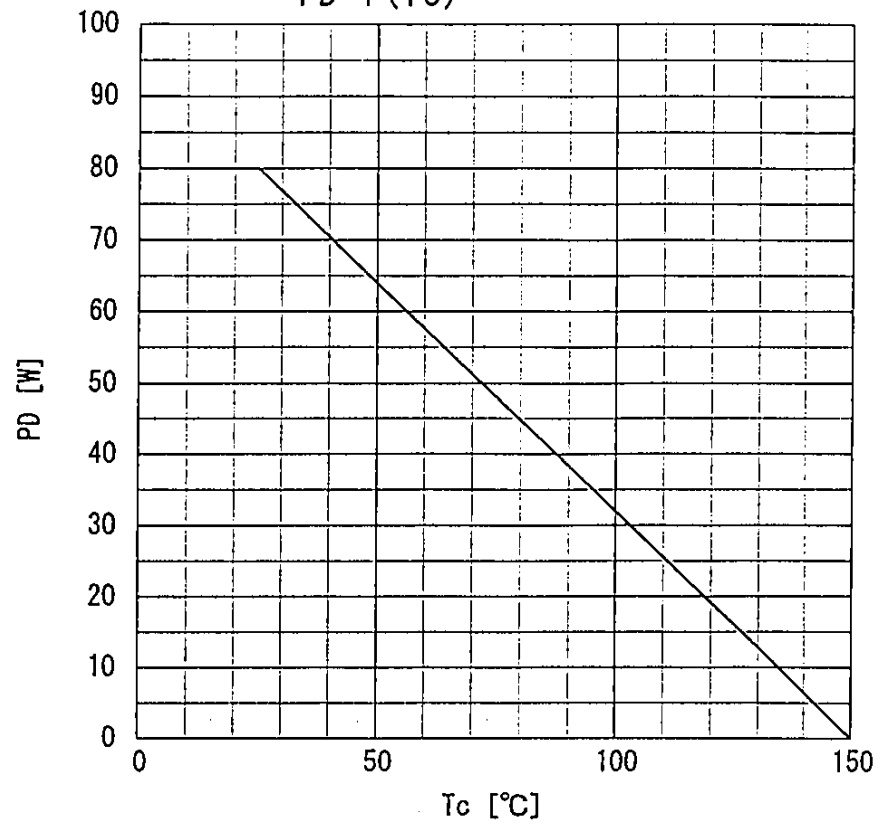
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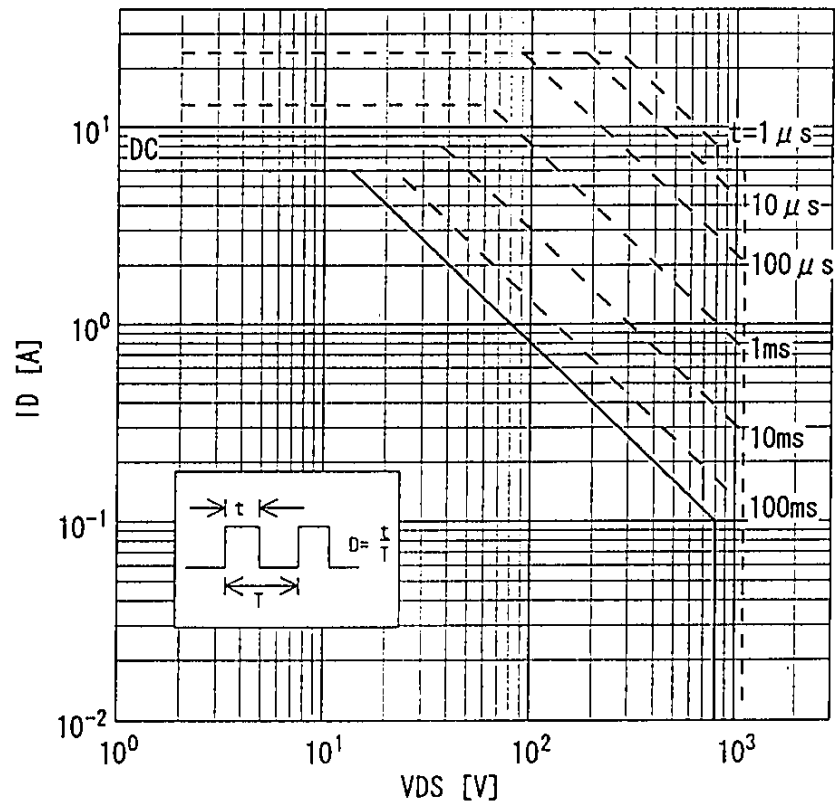
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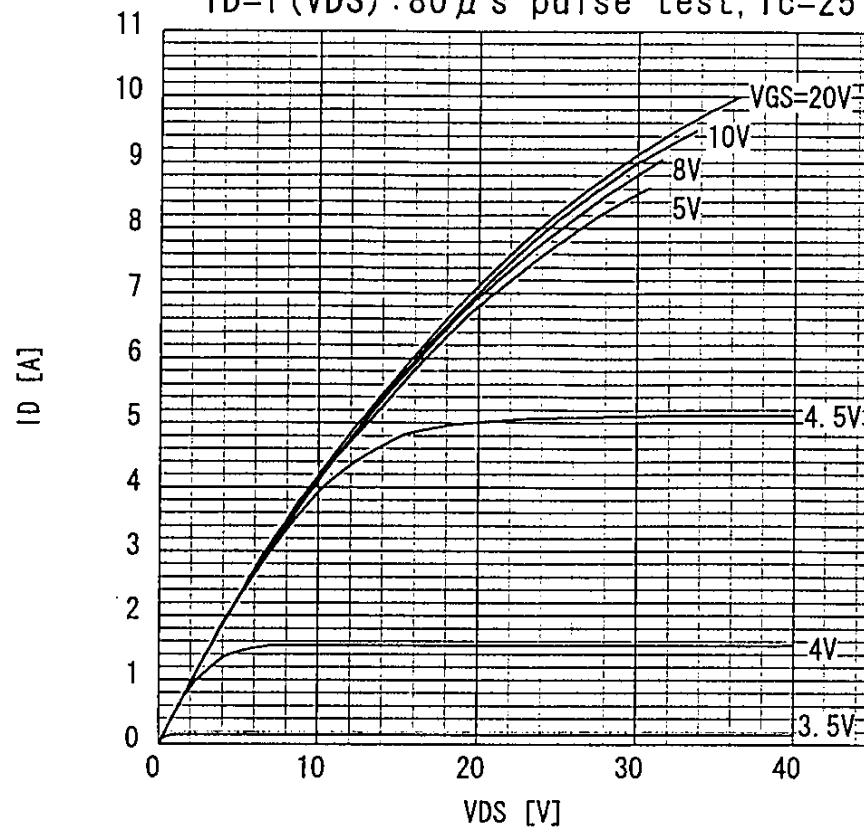
# Power Dissipation PD=f(Tc)



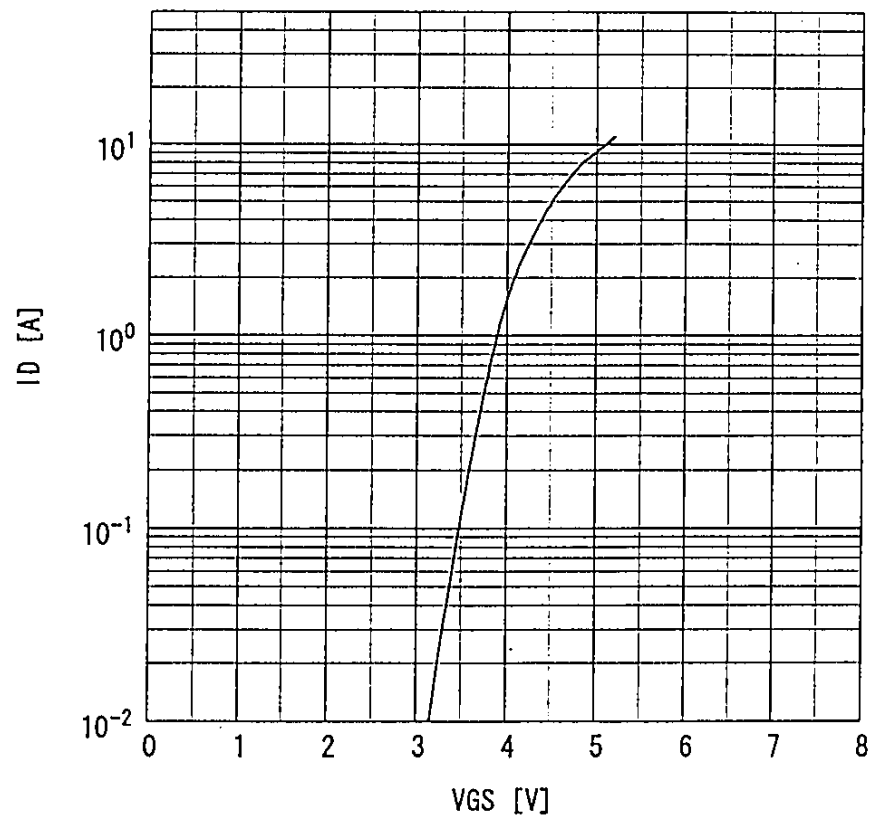
## Safe operating area ID=f(VDS) : D=0.01, Tc=25°C



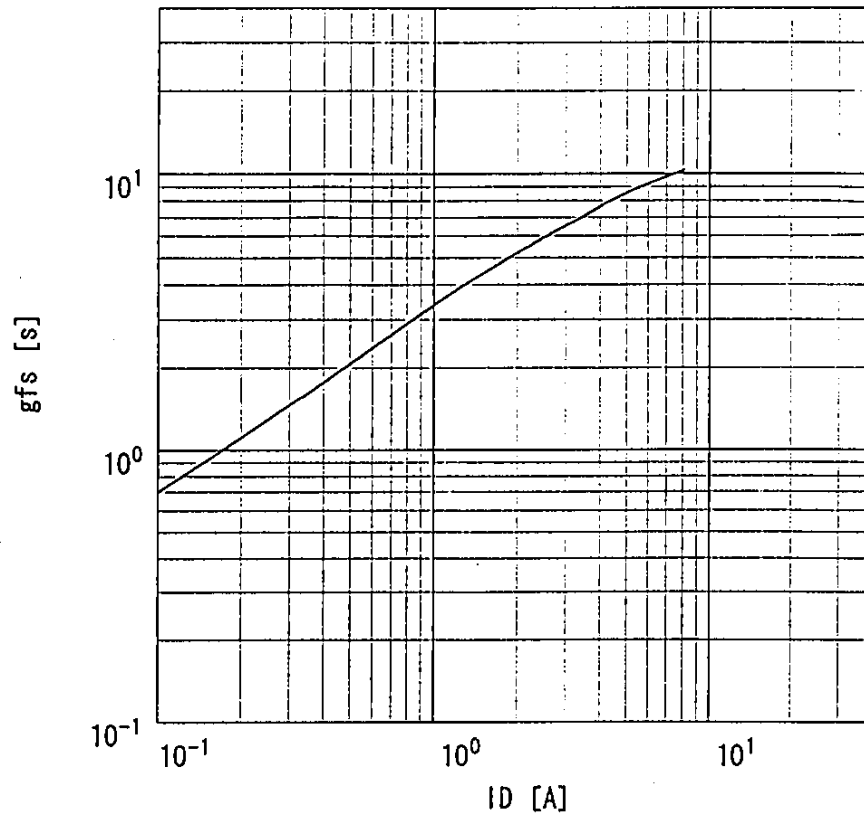
Typical output characteristics  
 $I_D = f(V_{DS}) : 80 \mu s \text{ pulse test, } T_c = 25^\circ C$



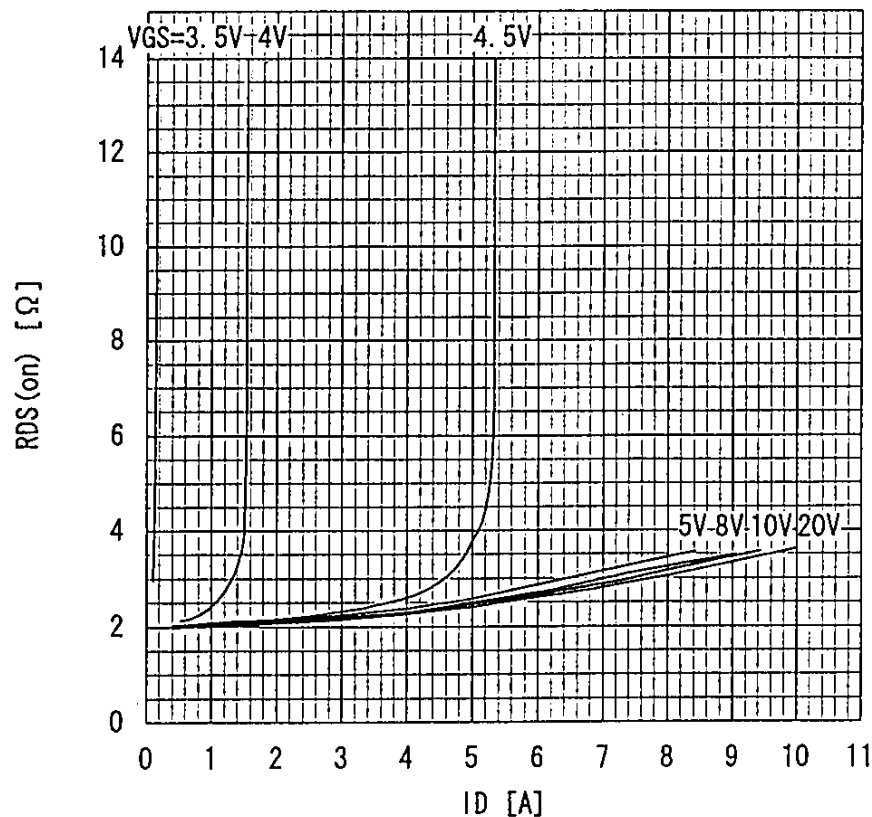
Typical transfer characteristic  
 $I_D = f(V_{GS}) : 80 \mu s \text{ pulse test, } V_{DS} = 25V, T_{ch} = 25^\circ C$



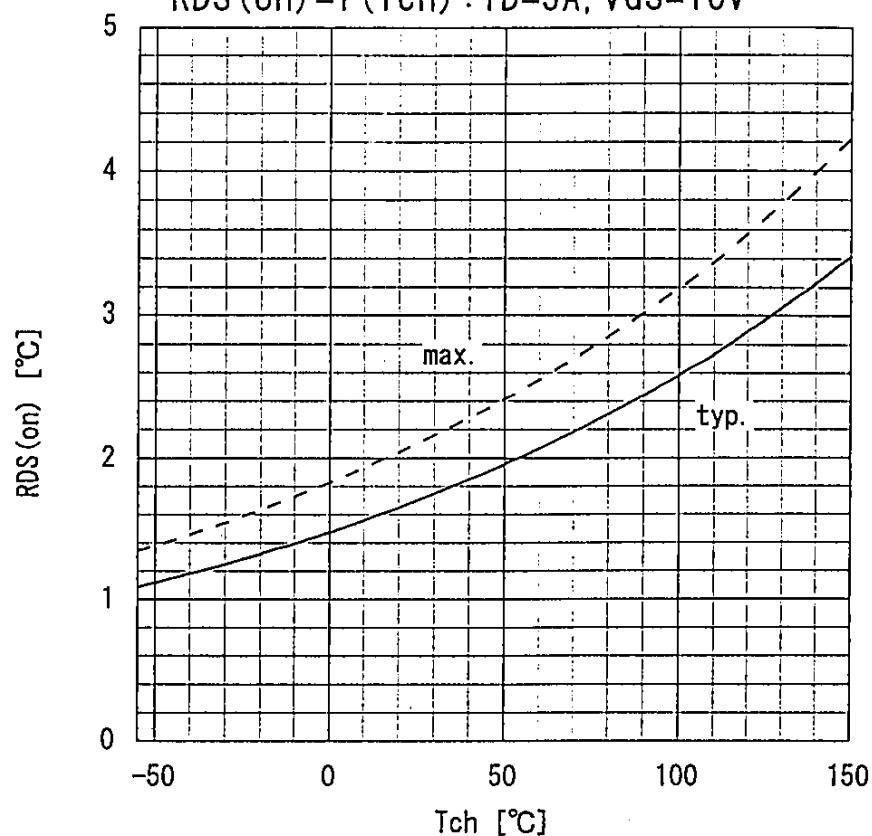
Typical forward transconductance  
 $g_{fs}=f(I_D)$ : 80  $\mu$ s pulse test,  $V_{DS}=25V$ ,  $T_{ch}=25^\circ C$



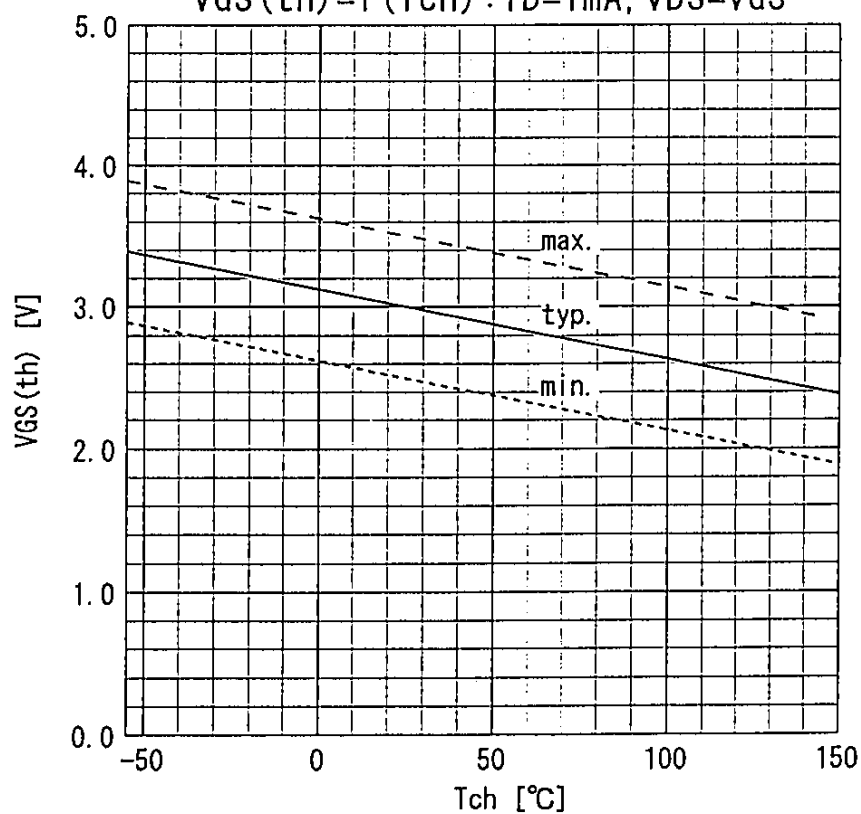
Typical drain-source on-state resistance  
 $R_{DS(on)}=f(I_D)$ : 80  $\mu$ s pulse test,  $T_c=25^\circ C$



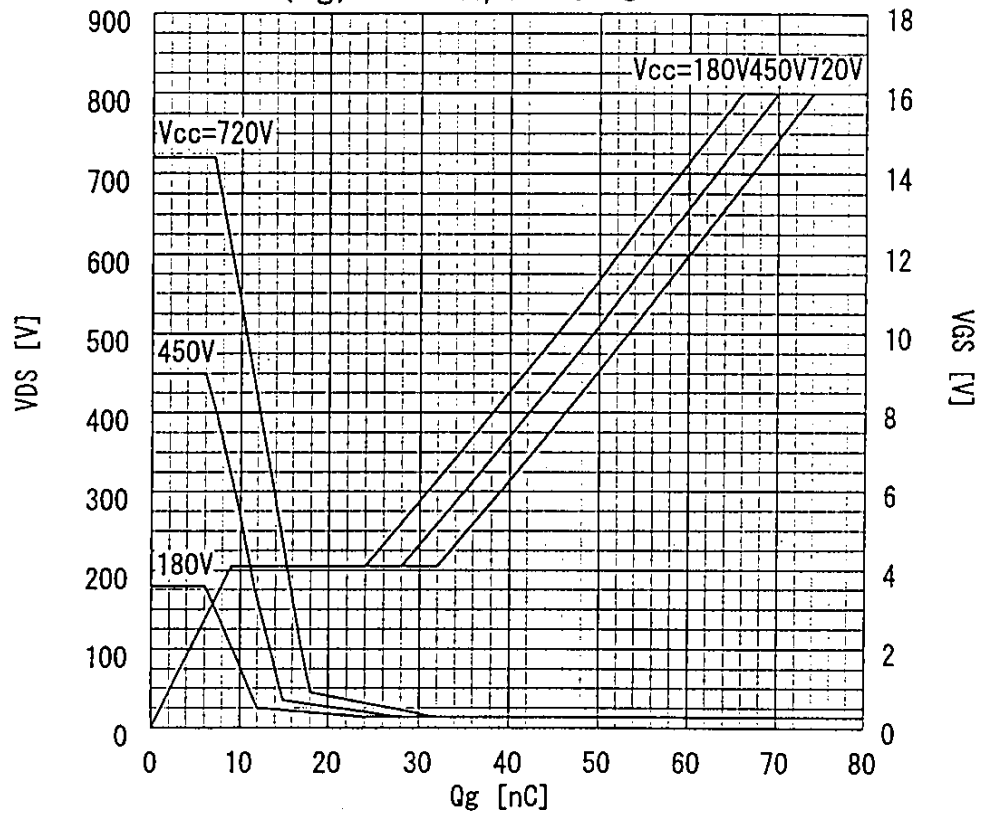
Drain-source on-state resistance  
 $R_{DS(on)} = f(T_{ch}) : I_D = 3A, V_{GS} = 10V$



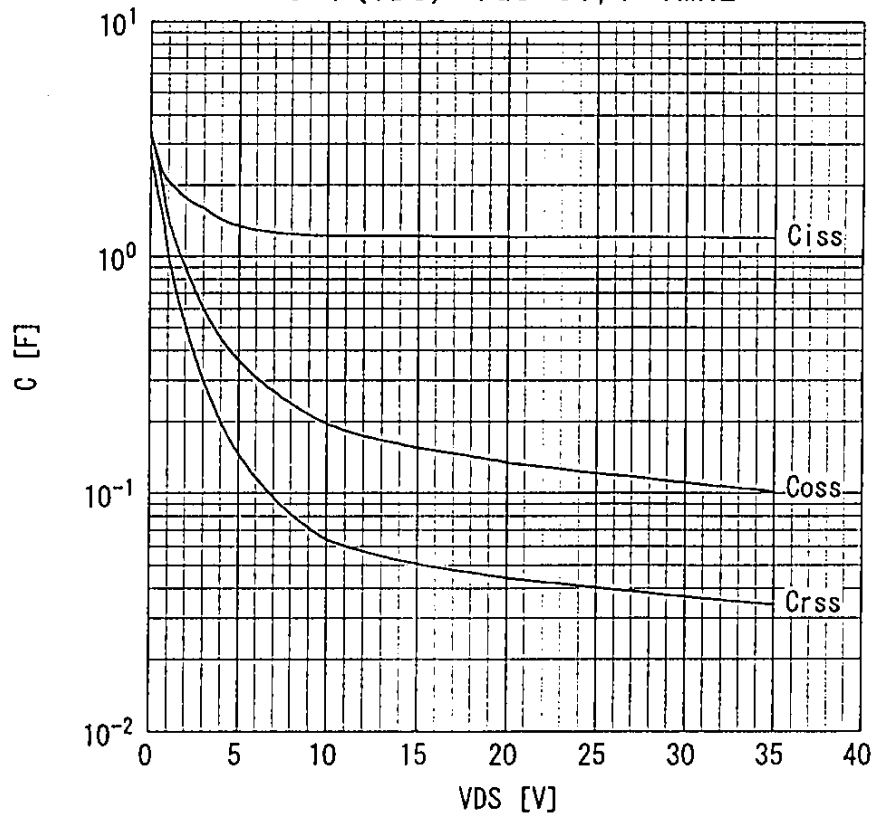
Gate threshold voltage  
 $V_{GS(th)} = f(T_{ch}) : I_D = 1mA, V_{DS} = V_{GS}$



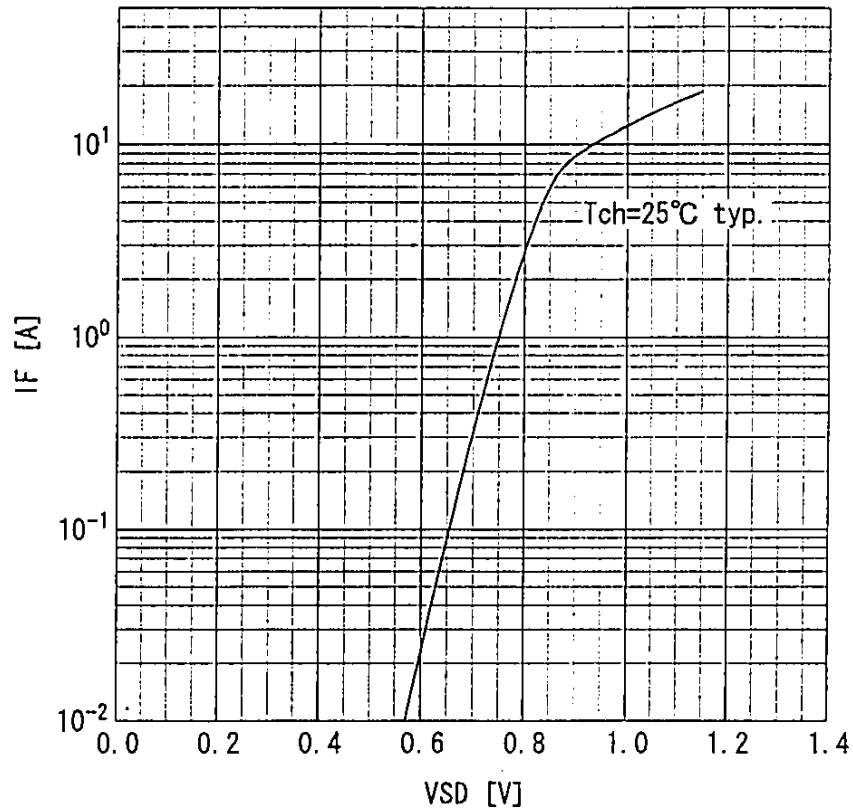
Typical gate charge characteristic  
 $V_{GS}=f(Q_g) : I_D=5A, T_c=25^\circ C$



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:  $D = t/T$

