# SPECIFICATION

DEVICE NAME : Power MOSFET

TYPE NAME : 2SK2052-R

SPEC. No. :

Fuji Electric Co.,Ltd.

This Specification is subject to change without notice.

| | DATE | NAME | APPROVED |
|---|---|---|---|
| DRAWN | | | |
| CHECKED | | | |

Fuji Electric Co.,Ltd.

DWG.NO. --



Y 0257-R-004a

1. Scope
This specifies Fuji power MOSFET 2SK2052-R

2. Construction N-channel enhancement mode power MOSFET

3. Application for switching

4. Outview TO-3PF Outview See to 4/10 page

5. Absolute maximum ratings at Tc=25℃ (unless otherwise specified)

| Description | Symbol | Characteristics | Unit | Remarks |
|---|---|---|---|---|
| Drain-source voltage | $V_{DS}$ | 500 | V | |
| Drain-gate voltage | $V_{DGR}$ | 500 | V | $R_{GS}$=20KΩ |
| Continuous Drain current | $I_D$ | ± 10 | A | |
| Pulsed drain current | $I_{Dpulse}$ | ± 40 | A | |
| Gate-source voltage | $V_{GS}$ | ± 20 | V | |
| Maximum power dissipation | $P_D$ | 80 | W | |
| Operating and storage temperature range | $T_{ch}$ | 150 | ℃ | |
| | $T_{stg}$ | -55 ~ +150 | ℃ | |

6. Electrical characteristics at Tc=25℃ (unless otherwise specified)
Static ratings

| Description | Symbol | Conditions | | Characteristics | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| Drain-source breakdown voltage | $BV_{DSS}$ | $I_D$=1mA $V_{GS}$=0V | | 500 | | | V |
| Gate threshold voltage | $V_{GS(th)}$ | $I_D$=10mA $V_{DS}$=$V_{GS}$ | | 2.1 | 3.0 | 4.0 | V |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$=500V $V_{GS}$= 0V | $T_{ch}$= 25℃ | | 10 | 500 | μA |
| | $I_{DSS}$ | | $T_{ch}$=125℃ | | 0.5 | 2.0 | mA |
| Gate-source leakage current | $I_{GSS}$ | $V_{GS}$=±20V $V_{DS}$= 0V | | | 10 | 100 | nA |
| Drain-source on-state resistance | $R_{DS(on)}$ | $I_D$ = 5 A $V_{GS}$=10 V | | | 0.80 | 1.10 | Ω |

Dynamic ratings

| Description | Symbol | Conditions | Characteristics | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| Forward transconductance | gfs | $I_D$ = 5 A<br>$V_{DS}$=25 V | 4 | 8 | | S |
| Input capacitance | Ciss | $V_{DS}$=25V<br>$V_{GS}$= 0V<br>f =1MHz | | 1100 | 1600 | pF |
| Output capacitance | Coss | | | 140 | 210 | pF |
| Reverse transfer capacitance | Crss | | | 75 | 110 | pF |
| Turn-on time | td(on) | $V_{CC}$=300V<br>$V_{GS}$= 10V<br>$I_D$ = 10A<br>$R_{GS}$= 25Ω | | 25 | 40 | ns |
| | tr | | | 60 | 90 | ns |
| Turn-off time | td(off) | | | 200 | 300 | ns |
| | tf | | | 90 | 140 | ns |

Reverse diode

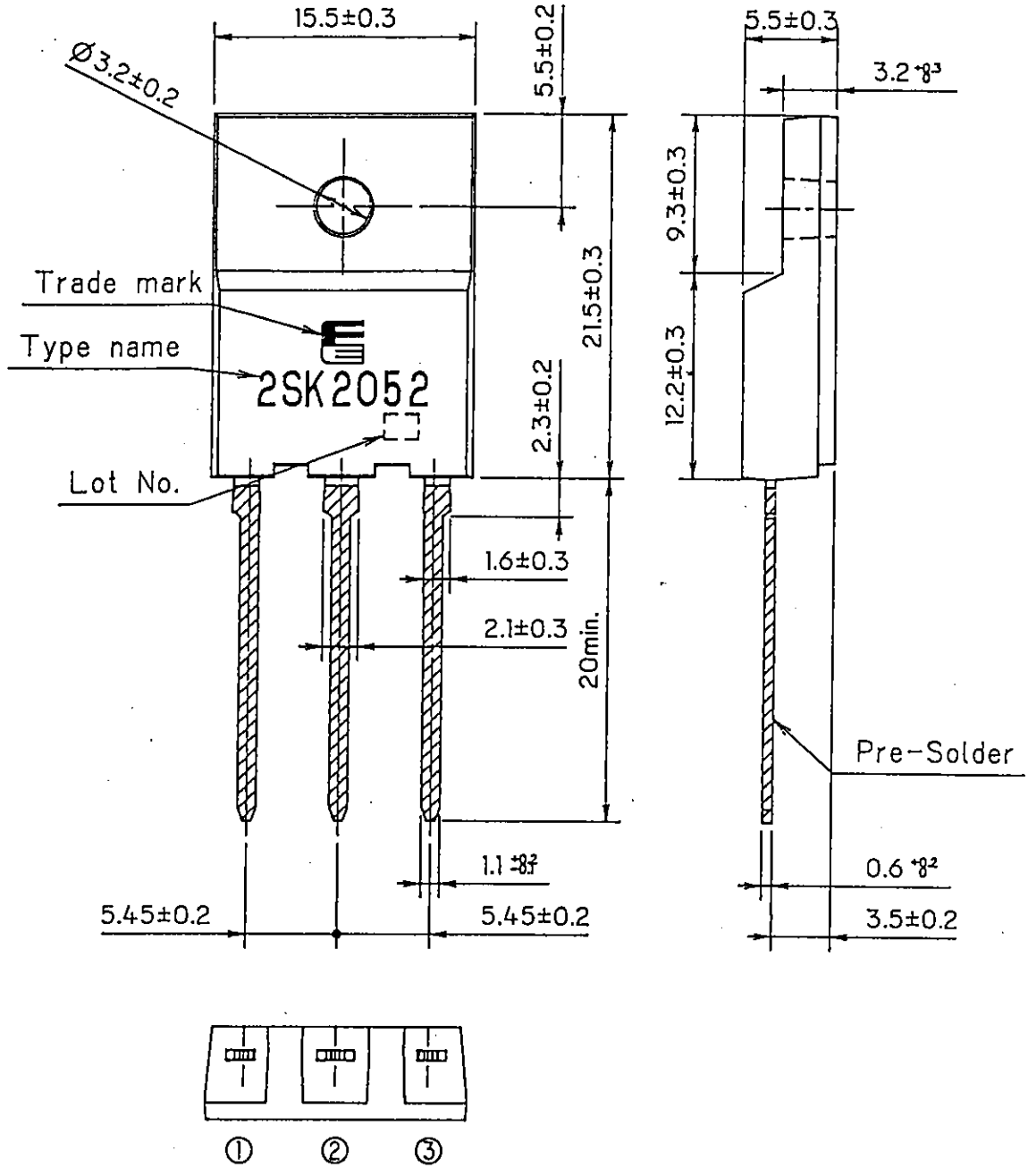
| Description | Symbol | Conditions | Characteristics | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| Diode forward on-voltage | $V_{SD}$ | $I_F$ = $I_{DR}$<br>$V_{GS}$=0V, $T_{ch}$= 25℃ | | 0.95 | 1.8 | V |
| Reverse recovery time | $t_{rr}$ | $I_F$ = $I_{DR}$<br>$V_{GS}$=0V<br>$-dI_F/dt$=100A/μs<br>$T_{ch}$= 25℃ | | 150 | 200 | ns |
| Reverse recovery charge | $Q_{rr}$ | | | 0.75 | | μC |

7. Thermal resistance

| Description | Symbol | Conditions | Characteristics | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| Thermal resistance | $R_{th(ch-c)}$ | | | | 1.56 | ℃/W |
| | $R_{th(ch-a)}$ | | | | 30 | ℃/W |

# FUJI POWER MOSFET

## TYPE : 2SK2052-R

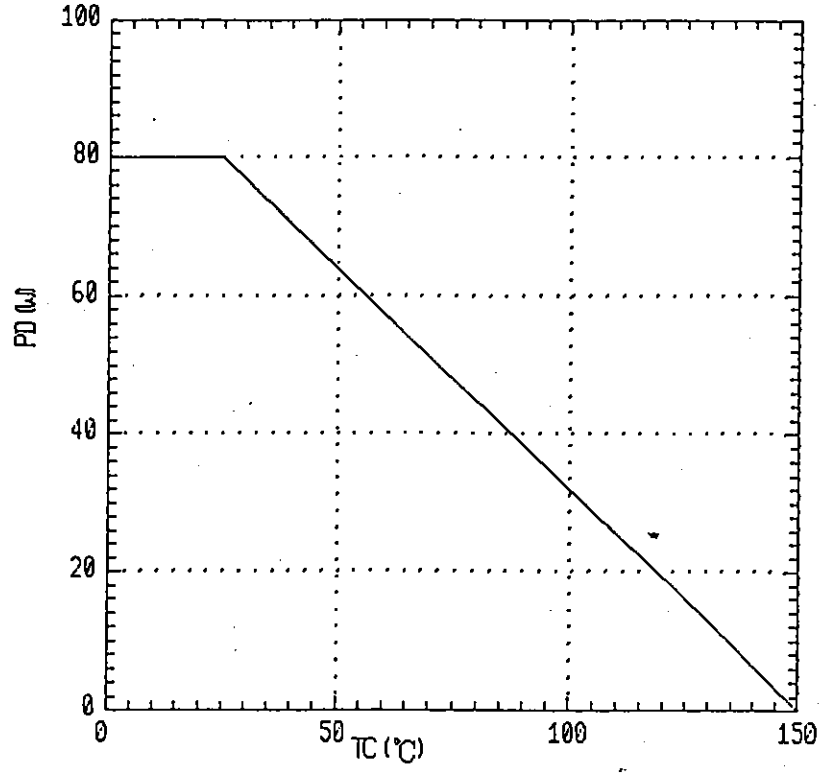



## CONNECTION

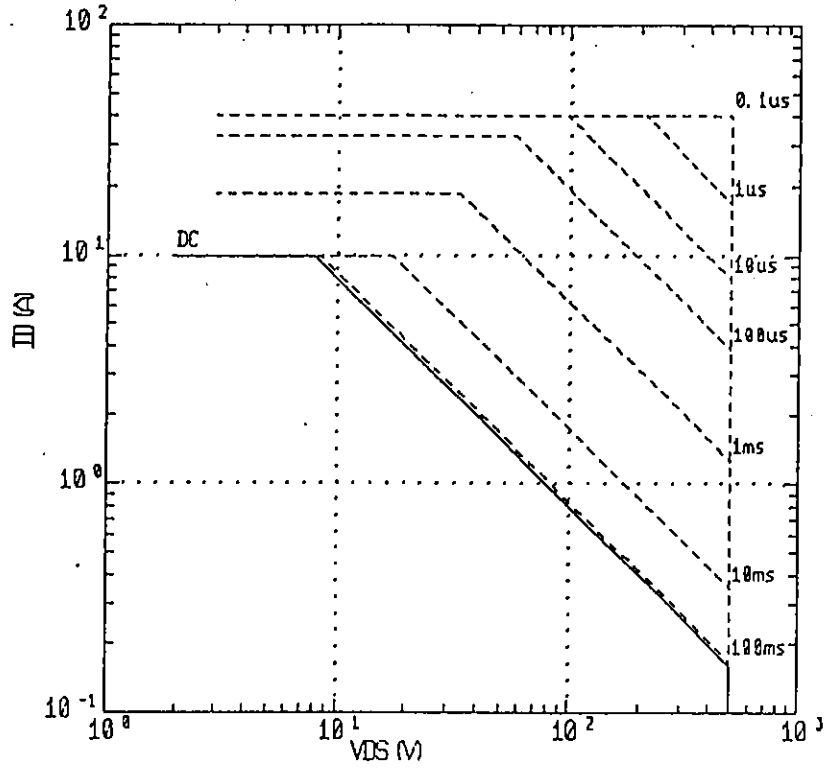
① GATE
② DRAIN
③ SOURCE

DIMENSIONS ARE IN MILLIMETERS.

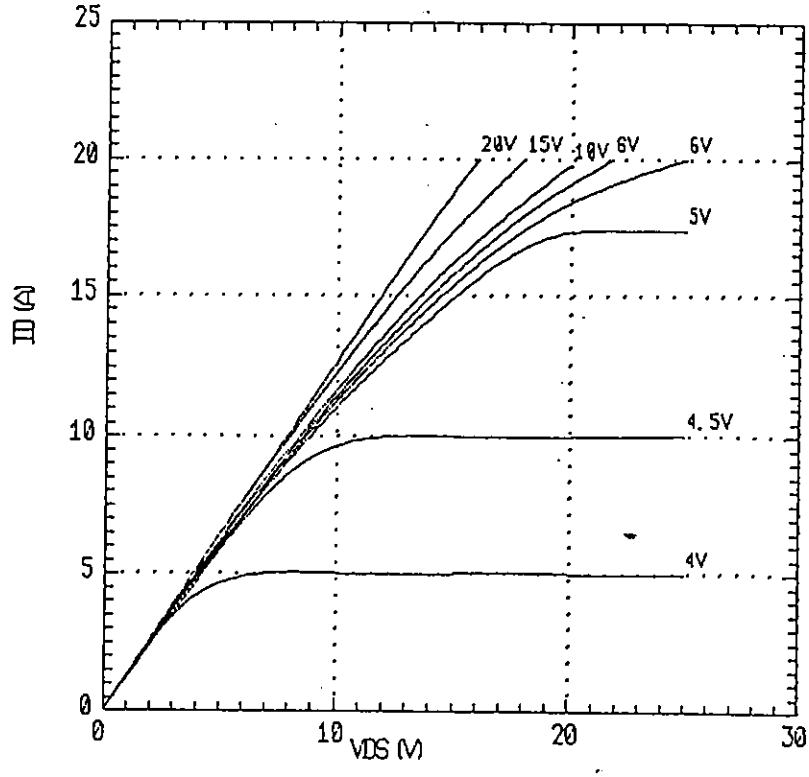
Power Dissipation
PD=f(TC)



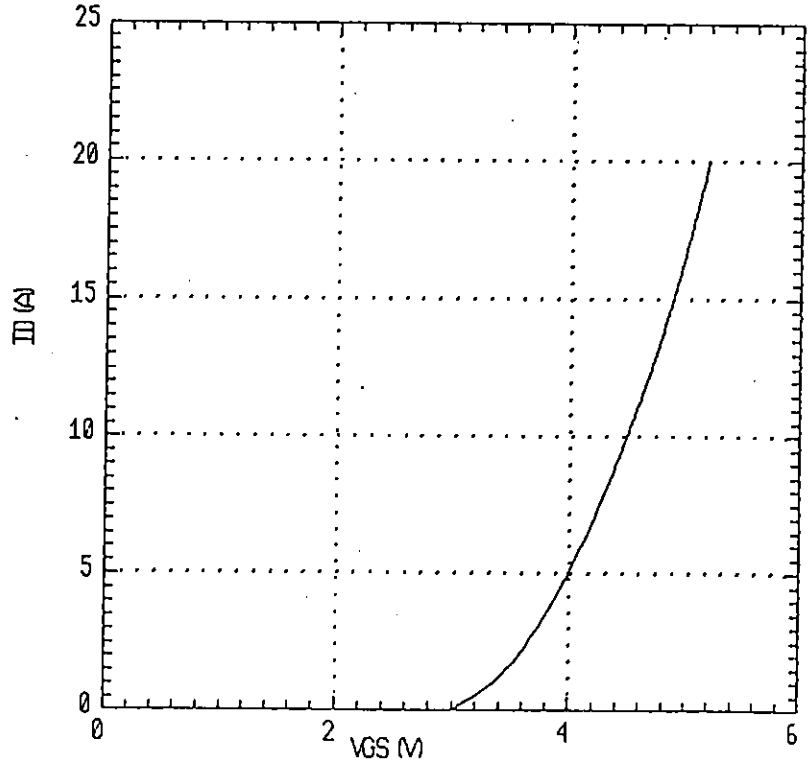

Safe operating area
ID=f(VDS):D=0.01,Tc=25℃



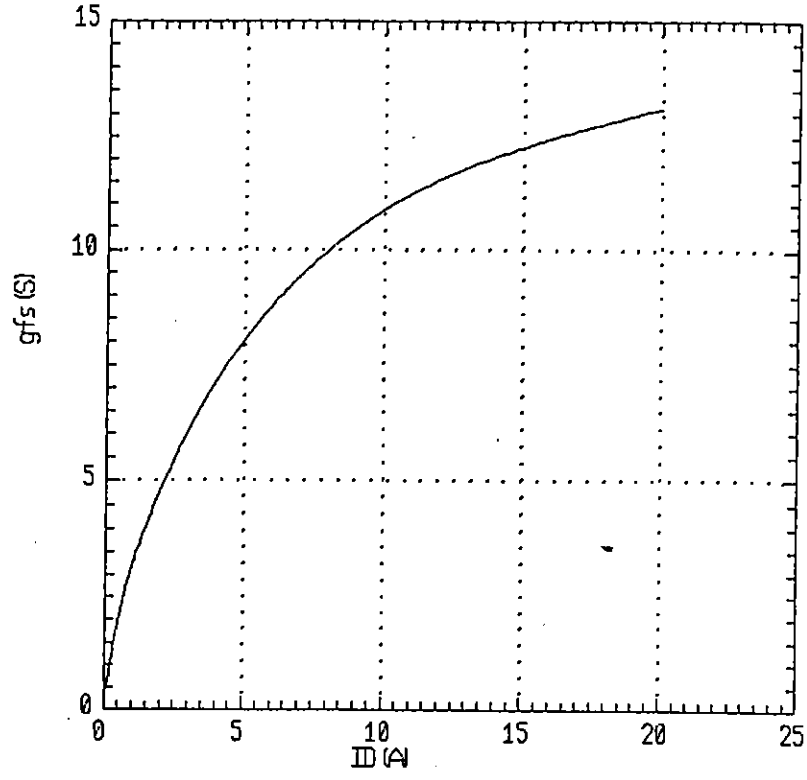
Typical output characteristics
ID=f(VDS):80μs pulse test,Tch=25°C



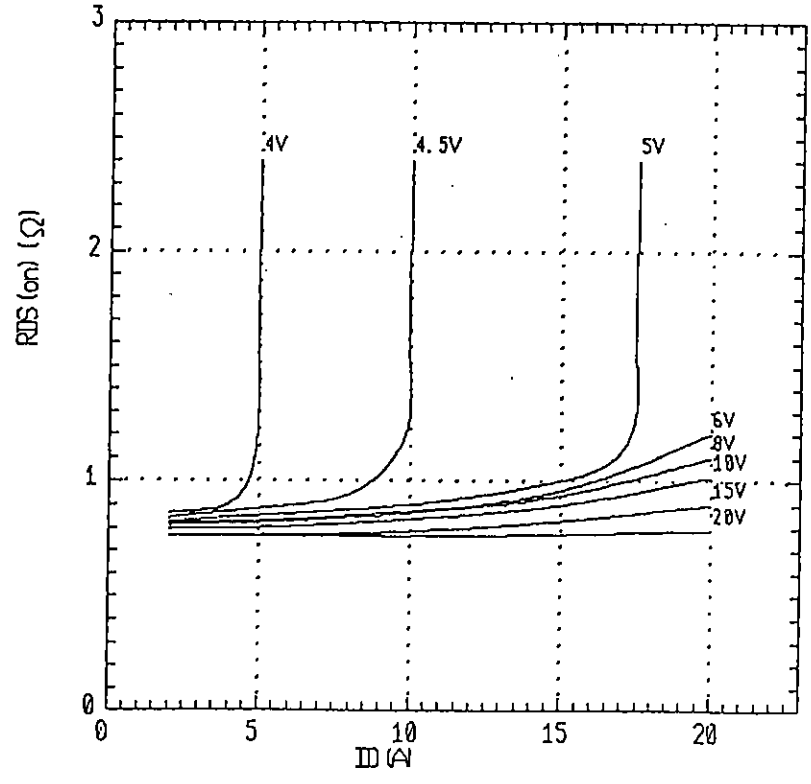

Typical Transfer Characteristic
ID=f(VGS):80μs pulse test,VDS=25V,Tch=25°C



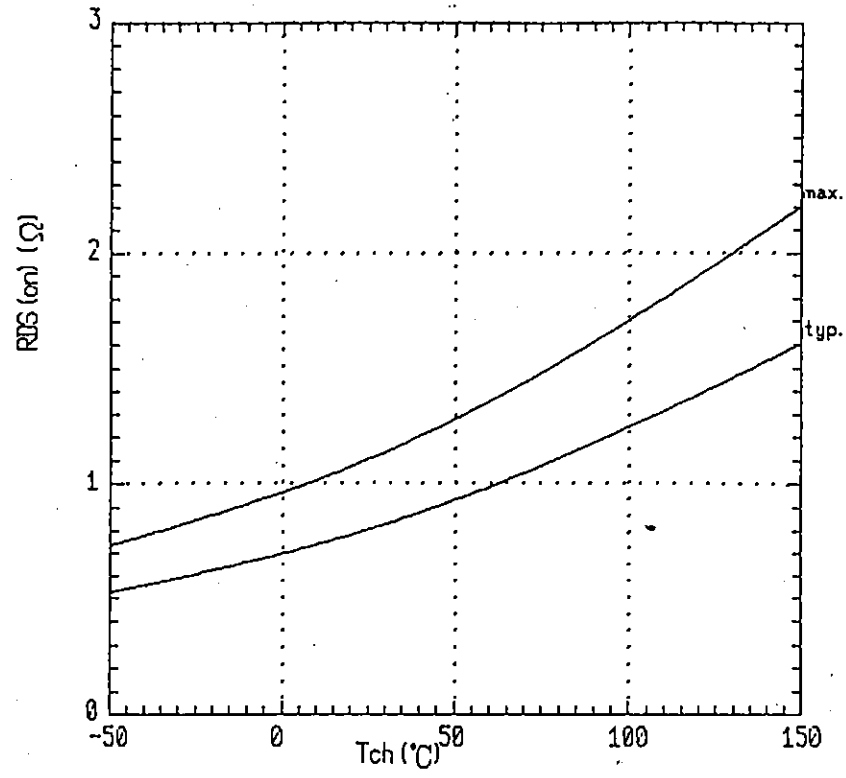
Typical Transconductance
gfs=f(ID):80μs pulse test,VDS=25V,Tch=25℃



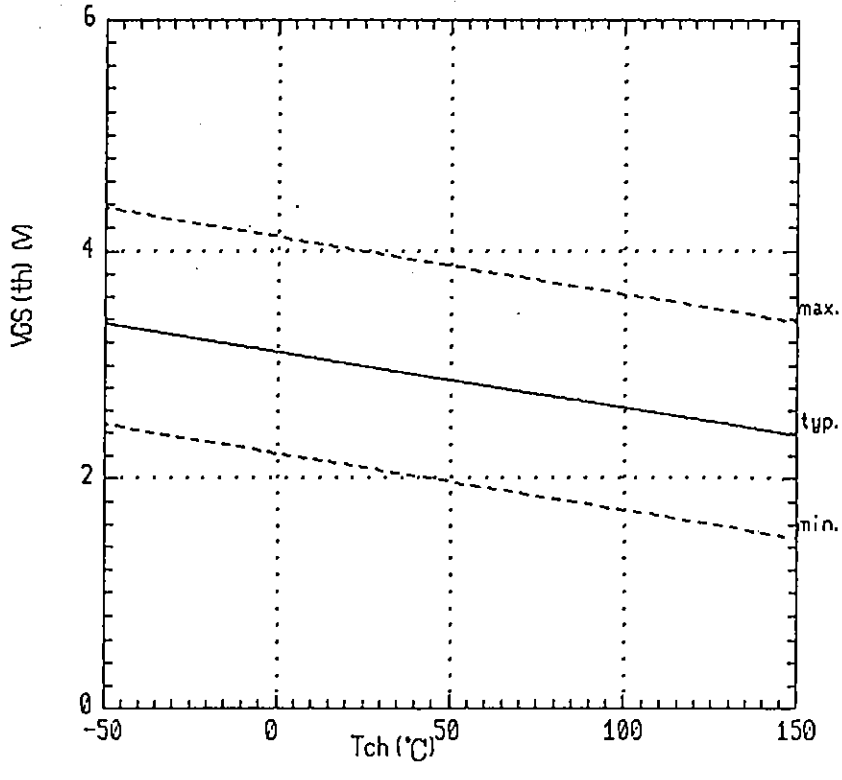

Typical Drain-source on-state resistance
RDS(on)=f(ID):80μs pulse test,Tch=25℃



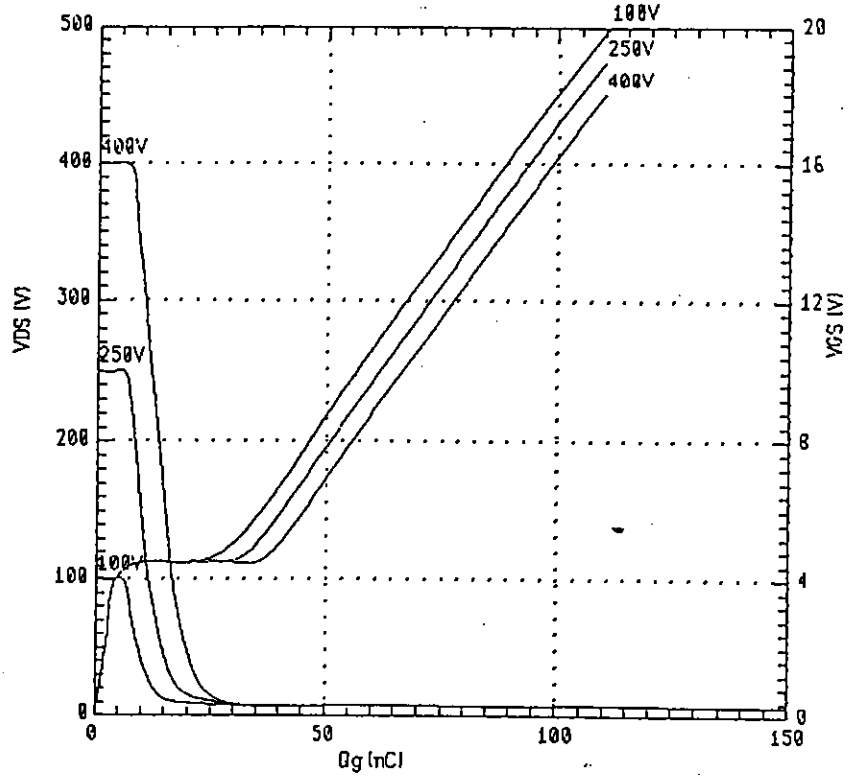
Drain-source on-state resistance
RDS(on)=f(Tch):ID=5A,VGS=10V



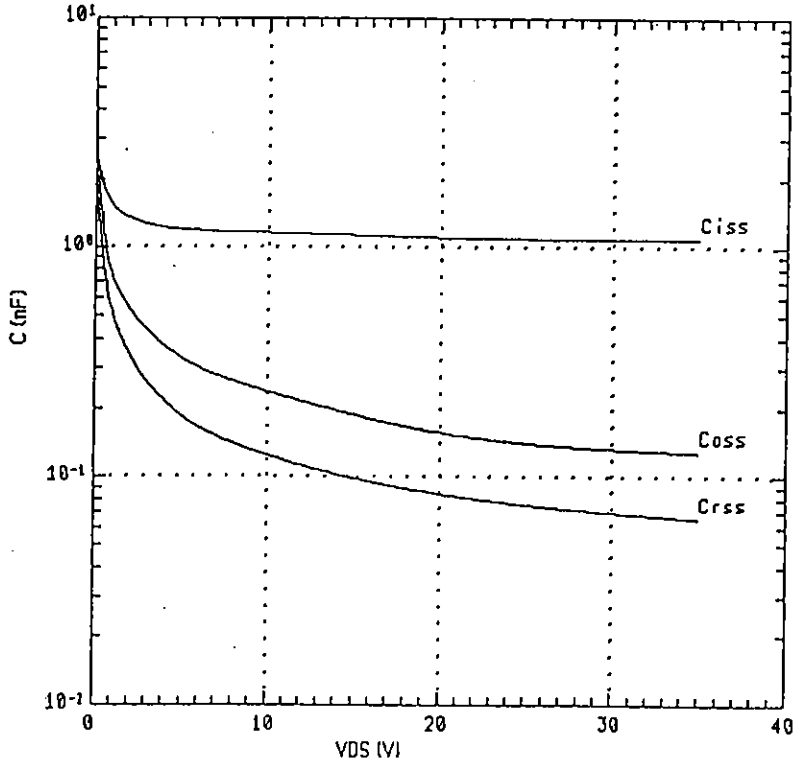

Gate threshold voltage
VGS(th)=f(Tch):VDS=VGS,ID=10mA



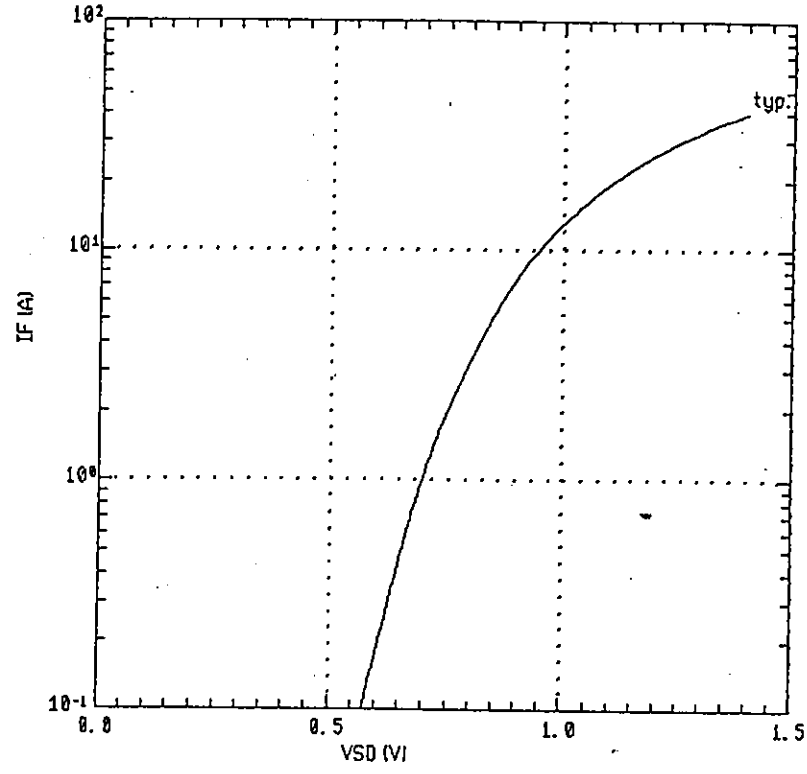
Typical gate charge characteristics
VGS=f(Qg):ID=10A




Typical capacitances
C=f(VDS):VGS=0V, f=1MHz



Farward characteristic of revese diode
IF=f(VSD):80μs pulse test,Tch=25℃




Transient thermal
impedance Zthch-c=f(t) parameter:D=t/T

