

# SPECIFICATION

DEVICE NAME : Power MOSFET

TYPE NAME : 2SK1549-R

SPEC. No. :

Fuji Electric Co.,Ltd.

This Specification is subject to change without notice.

	DATE	NAME	APPROVED		<b>Fuji Electric Co.,Ltd</b>
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CHECKED					
				DWG.NO.	1/10

1. Scope  
This specifies Fuji power MOSFET 2SK1549-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  $T_c=25^\circ\text{C}$  (unless otherwise specified)

Description	Symbol	Characteristics	Unit	Remarks
Drain-source voltage	$V_{DS}$	250	V	
Drain-gate voltage	$V_{DGR}$	250	V	$R_{GS} = 20\text{K}\Omega$
Continuous Drain current	$I_D$	$\pm 20$	A	
Pulsed drain current	$I_{Dpul}$	$\pm 80$	A	
Gate-source voltage	$V_{GS}$	$\pm 20$	V	
Maximum power dissipation	$P_D$	80	W	
Operating and storage temperature range	$T_{ch}$	150	$^\circ\text{C}$	
	$T_{stg}$	-55 ~ +150	$^\circ\text{C}$	

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	$BV_{DSS}$	$I_D = 1\text{mA}$ $V_{GS} = 0\text{V}$	250			V
Gate threshold voltage	$V_{GS(th)}$	$I_D = 10\text{mA}$ $V_{DS} = V_{GS}$	2.1	3.0	4.0	V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 250\text{V}$ $V_{GS} = 0\text{V}$	$T_{ch} = 25^\circ\text{C}$	10	500	$\mu\text{A}$
	$I_{DSS}$		$T_{ch} = 125^\circ\text{C}$	0.2	1.0	mA
Gate-source leakage current	$I_{GSS}$	$V_{GS} = \pm 20\text{V}$ $V_{DS} = 0\text{V}$		10	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$I_D = 10\text{A}$ $V_{GS} = 10\text{V}$		0.11	0.15	$\Omega$

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Dynamic ratings

Description	Symbol	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Forward transconductance	$g_{fs}$	$I_D = 10\text{ A}$ $V_{DS} = 25\text{ V}$	8.0	15.0		S
Input capacitance	$C_{iss}$	$V_{DS} = 25\text{ V}$ $V_{GS} = 0\text{ V}$ $f = 1\text{ MHz}$		2000	3000	pF
Output capacitance	$C_{oss}$			350	500	pF
Reverse transfer capacitance	$C_{rss}$			110	200	pF
Turn-on time	$t_{d(on)}$	$V_{CC} = 30\text{ V}$ $V_{GS} = 10\text{ V}$ $I_D = 3\text{ A}$ $R_{GS} = 50\ \Omega$		30	50	ns
	$t_r$			70	110	ns
Turn-off time	$t_{d(off)}$			400	600	ns
	$t_f$			120	180	ns

Reverse diode

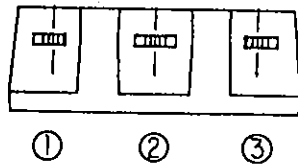
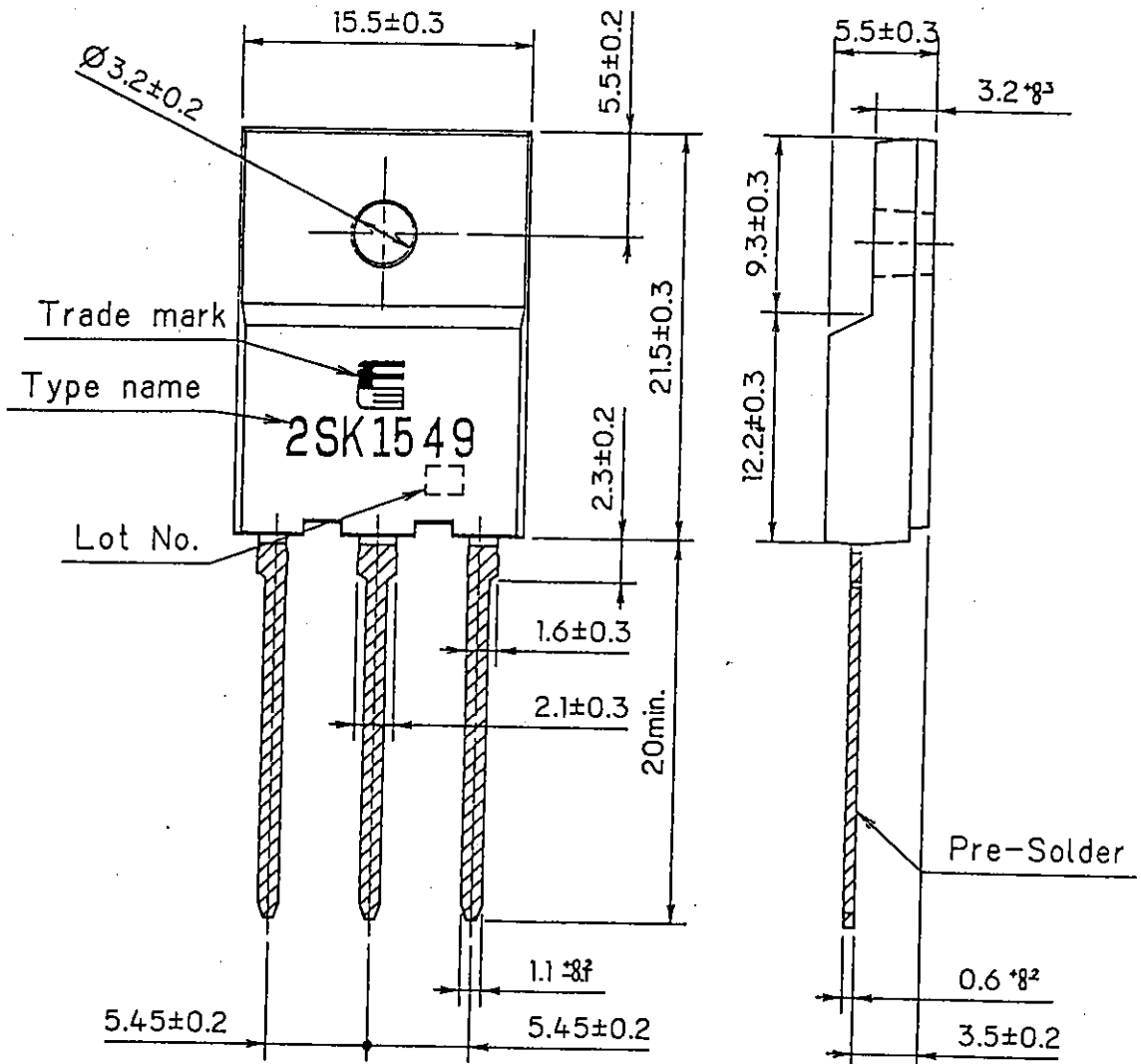
Description	Symbol	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Diode forward on-voltage	$V_{SD}$	$I_F = 2 \times I_{DR}$ $V_{GS} = 0\text{ V}$ , $T_{CH} = 25^\circ\text{C}$		1.0	1.7	V
Reverse recovery time	$t_{rr}$	$I_F = I_{DR}$ $V_{GS} = 0\text{ V}$ $-di_F/dt = 100\text{ A}/\mu\text{s}$ $T_{CH} = 25^\circ\text{C}$		250		ns
Reverse recovery charge	$Q_{rr}$			2		$\mu\text{C}$

7. Thermal resistance

Description	Symbol	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Thermal resistance	$R_{th_{ch-c}}$				1.56	$^\circ\text{C}/\text{W}$
	$R_{th_{ch-a}}$				30.0	$^\circ\text{C}/\text{W}$

FUJI POWER MOSFET

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CONNECTION

- ① GATE
- ② DRAIN
- ③ SOURCE

DIMENSIONS ARE IN MILLIMETERS.

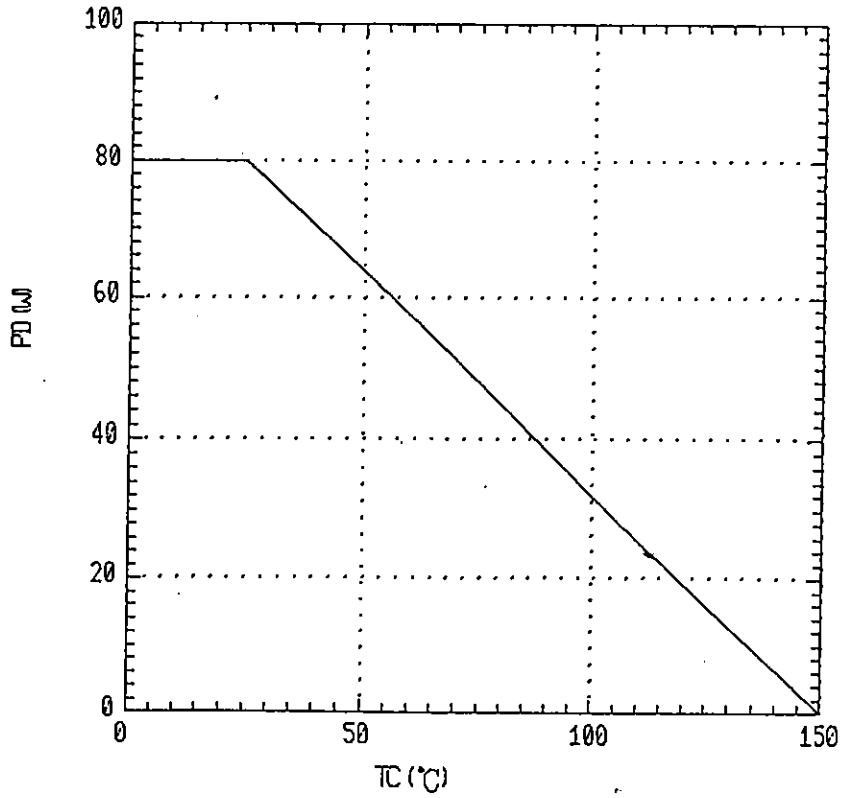
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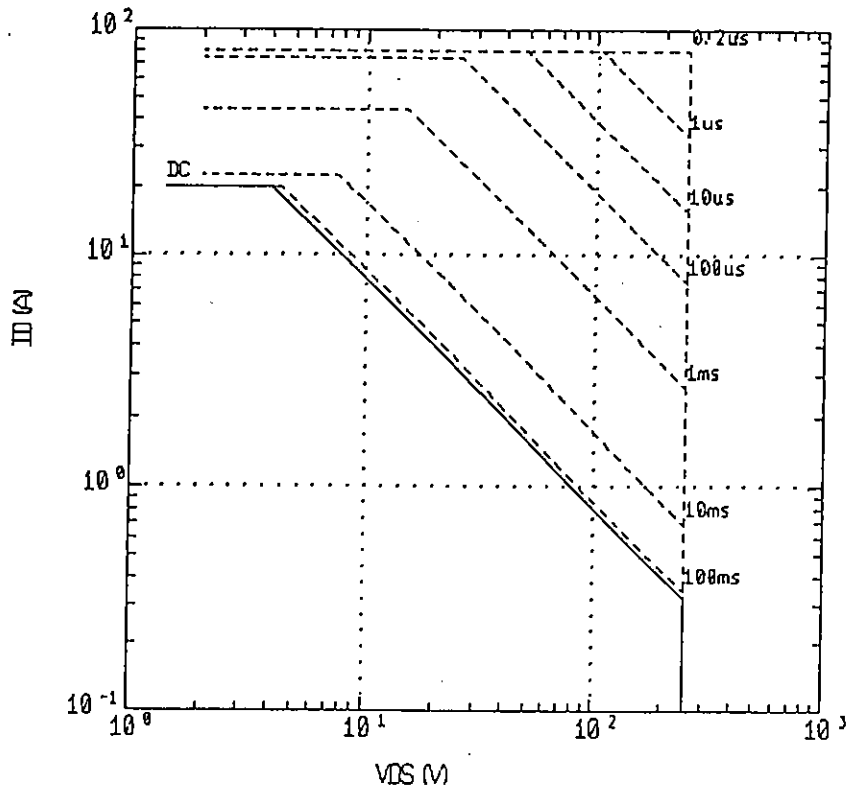
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Power Dissipation  
 $PD=f(TC)$



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



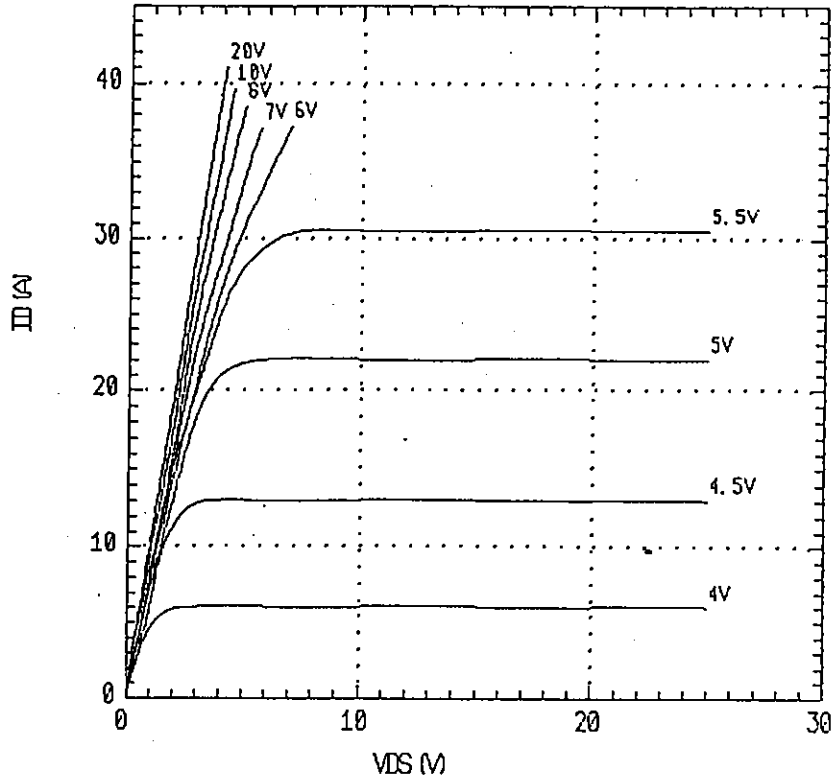
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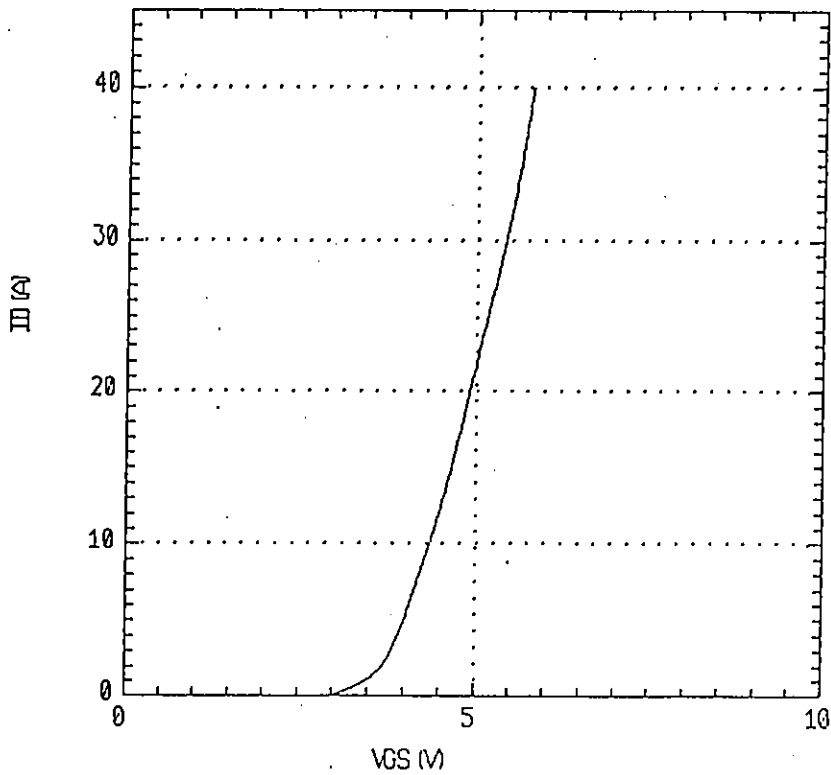
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Typical output characteristics  
 $I_D = f(V_{DS})$ : 80  $\mu$ s pulse test,  $T_{ch} = 25^\circ\text{C}$



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



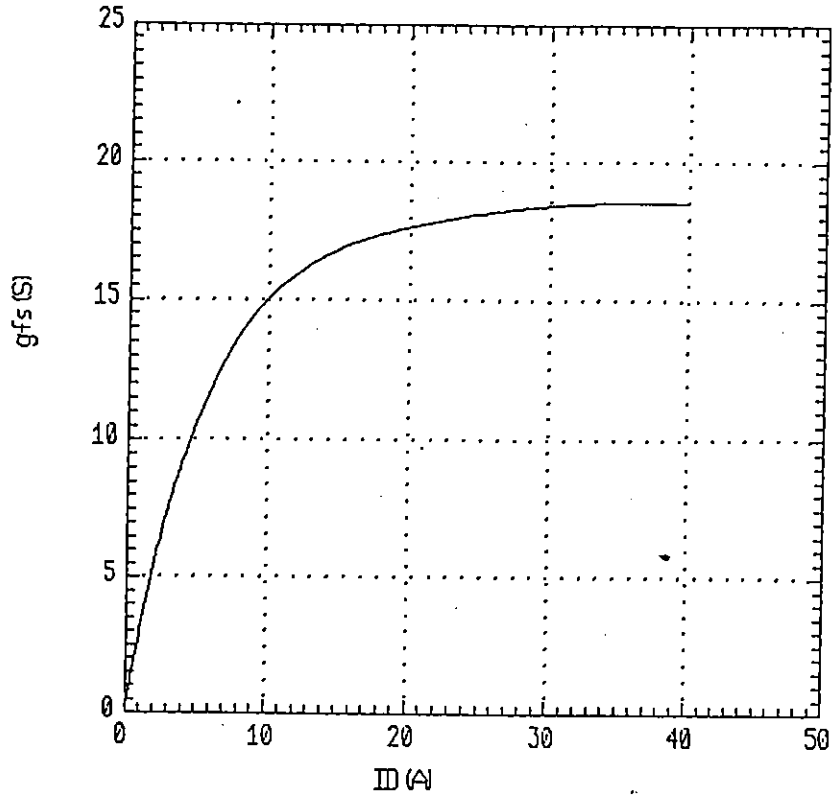
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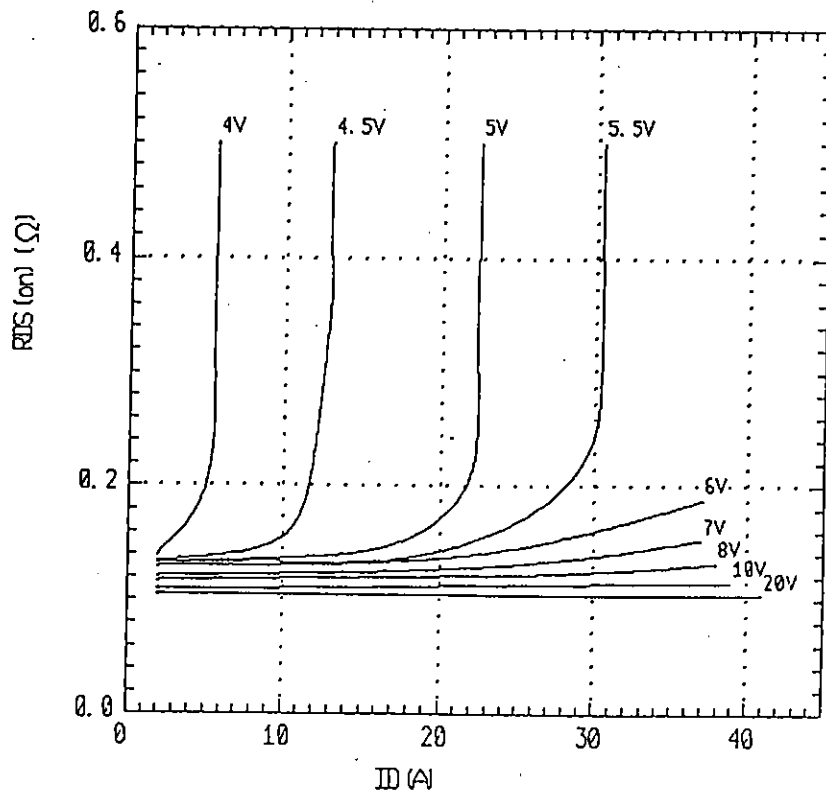
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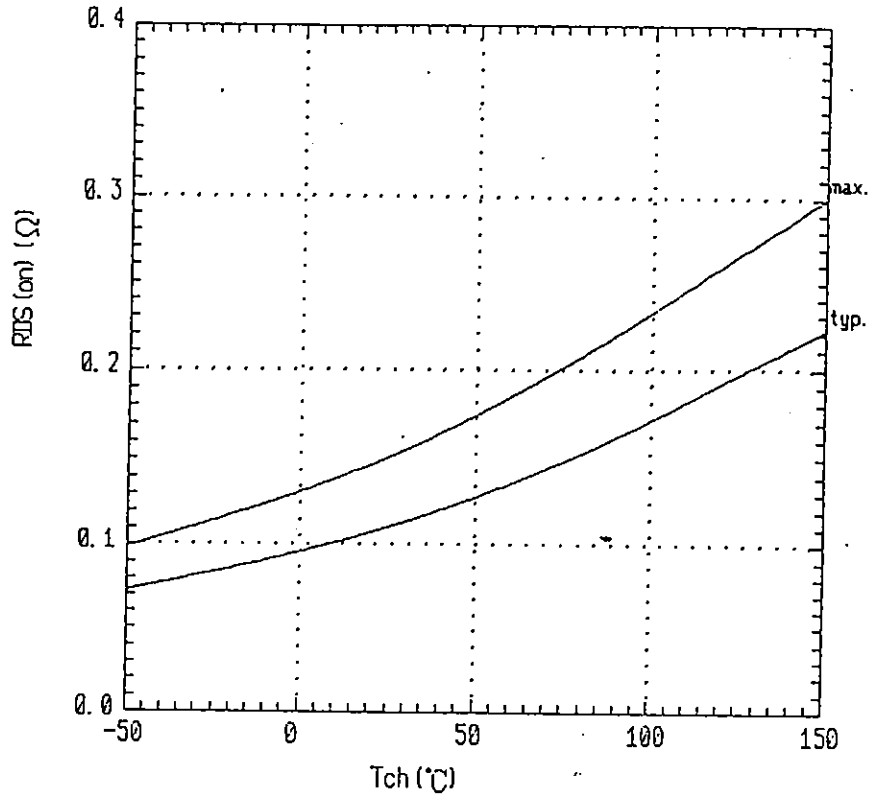
Typical Transconductance  
 $g_{fs}=f(I_D): 80\mu s$  pulse test,  $V_{DS}=25V, T_{ch}=25^\circ C$



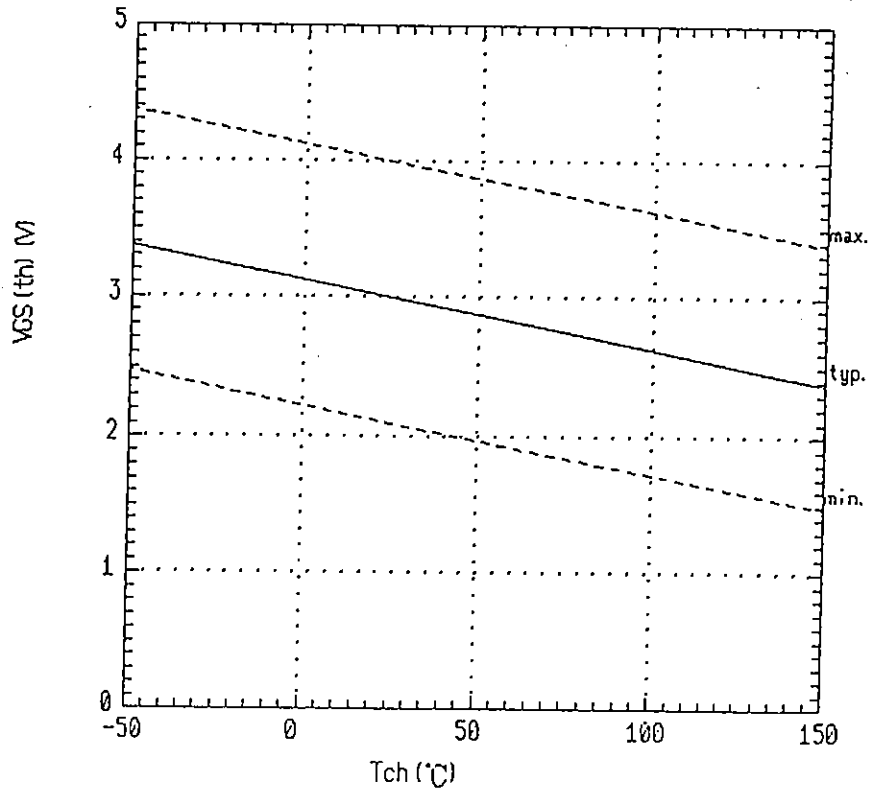
Typical Drain-source on-state resistance  
 $R_{DS(on)}=f(I_D): 80\mu s$  pulse test,  $T_{ch}=25^\circ C$



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

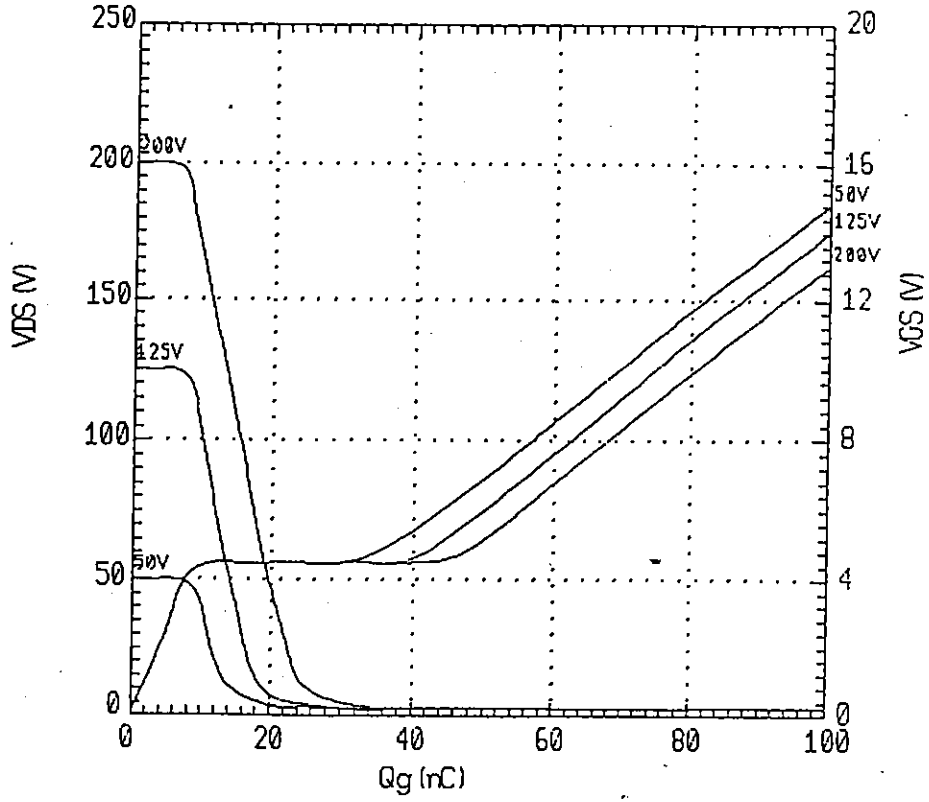


Gate threshold voltage  
 $V_{GS(th)} = f(T_{ch}) : V_{DS} = V_{GS}, I_D = 10mA$

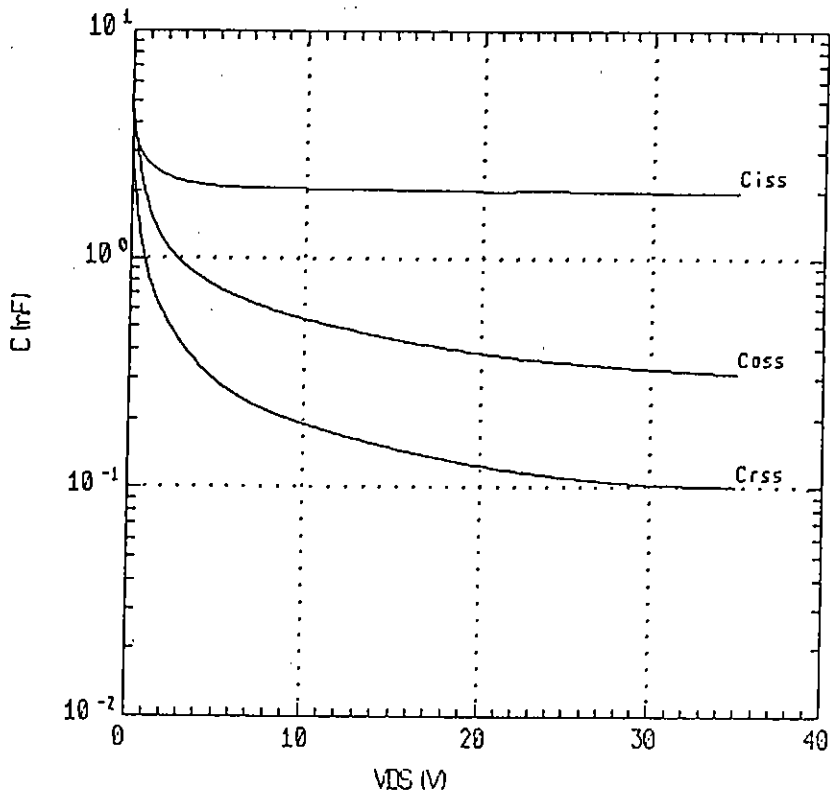




Typical gate charge characteristics  
 $V_{GS} = f(Q_g) : I_D = 20A, T_{ch} = 25^\circ C$



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



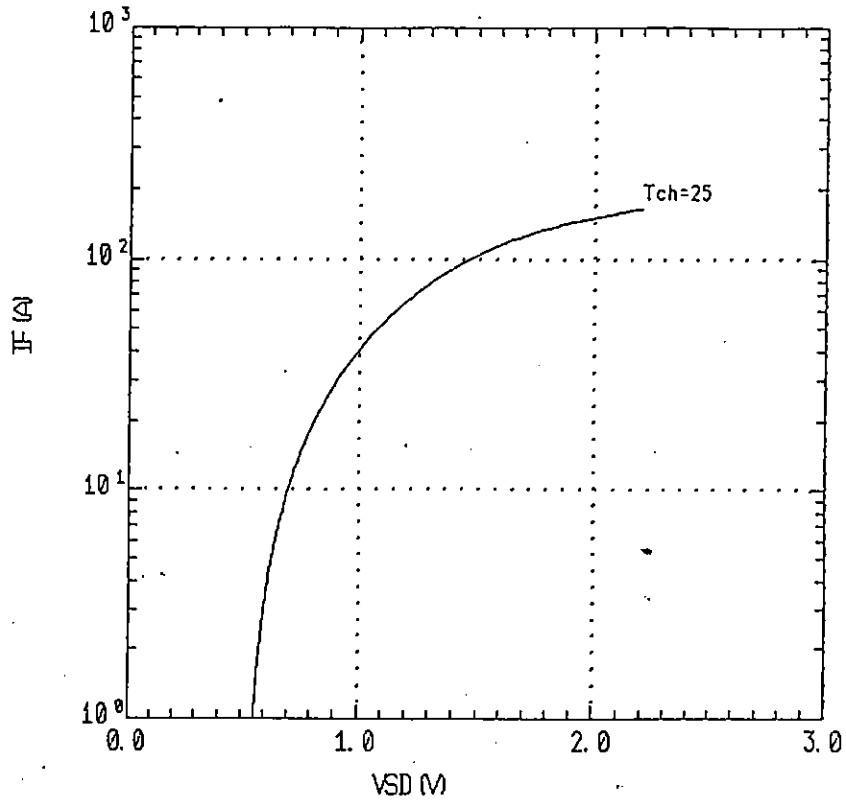
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Forward characteristic of reverse diode  
 $I_F = f(V_{SD}) : 80 \mu s$  pulse test,  $V_{GS} = 0V$



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

