

Fuji power MOSFET Specification

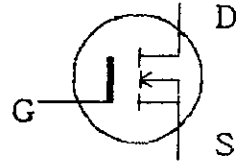
2SK1016

1. Scope

This specifies Fuji power MOSFET 2SK1016

2. Outline

- I) Construction N-channel enhancement mode power MOSFET
 II) Application for switching
 III) Outview TO-3P

3. Absolute maximum ratings at $T_c=25^\circ\text{C}$ (unless otherwise specified)

Description	Symbol	Characteristics	Unit	Remarks
Drain-source voltage	V_{DS}	500	V	
Drain-gate voltage	V_{DGR}	500	V	$R_{GS}=20\text{K}\Omega$
Continuous Drain current	I_D	15	A	
Pulsed drain current	I_{Dpulse}	40	A	
Gate-source voltage	V_{GS}	± 30	V	
Maximum power dissipation	P_D	125	W	
Operating and storage temperature range	T_j T_{stg}	150 -55 ~ +150	$^\circ\text{C}$	

4. 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}	$I_D=1\text{mA}$ $V_{GS}=0\text{V}$	500			V
Gate threshold voltage	$V_{GS(th)}$	$I_D=1\text{mA}$ $V_{DS}=V_{GS}$	2.5	3.5	5.0	V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=500\text{V}$ $V_{GS}=0\text{V}$ $T_j=25^\circ\text{C}$		10	500	μA
	I_{DSS}	$T_j=125^\circ\text{C}$		0.2	1.0	mA
Gate-source leakage current	I_{GSS}	$V_{GS}=\pm 30\text{V}$ $V_{DS}=0\text{V}$		10	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$I_D=8\text{A}$ $V_{GS}=10\text{V}$		0.36	0.55	Ω

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DATE	NAME	APPROVED	Fuji Electric Co., Ltd.		
DRAWN Nov. 21 '89	N. Fujisawa		DWG. NO.	MT5F1306	1/5
CHECKED Nov. 21 '89	S. Furukawa				

Dynamic ratings

Description	Symbol	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Forward transconductance	g_{fs}	$I_D = 8A$ $V_{DS} = 25V$	5.0	10.0		S
Input capacitance	C_{iss}	$V_{DS} = 25V$ $V_{GS} = 0V$ $f = 1MHz$		1800	2700	pF
Output capacitance	C_{oss}			270	410	pF
Reverse transfer capacitance	C_{rss}			120	185	pF
Turn-on time	$t_d(ON)$	$V_{CC} = 300V$ $V_{GS} = 10V$ $I_D = 15A$ $R_{GS} = 25\Omega$		70	110	ns
	t_r			100	150	ns
Turn-off time	$t_d(OFF)$			250	380	ns
	t_f			80	120	ns

Reverse diode

Description	Symbol	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Continuous reverse drain current	I_{DR}				15	A
Pulsed reverse deain current	I_{DRM}				40	A
Diode forward on-voltage	V_{SD}	$I_F = 2 \times I_{DR}$ $V_{GS} = 0V, T_j = 25^\circ C$		1.1	1.65	V
Reverse recovery time	t_{rr}	$I_F = I_{DR}$ $V_{GS} = 0V$ $-dI_F/dt = 100A/\mu s$ $T_j = 25^\circ C$		400		ns
Reverse recovery charge	Q_{rr}			4		μC

5. Thermal resistance

Description	Symbol	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Thermal resistance	$R_{th j-c}$				1.0	$^\circ C/W$
	$R_{th j-a}$				35.0	$^\circ C/W$

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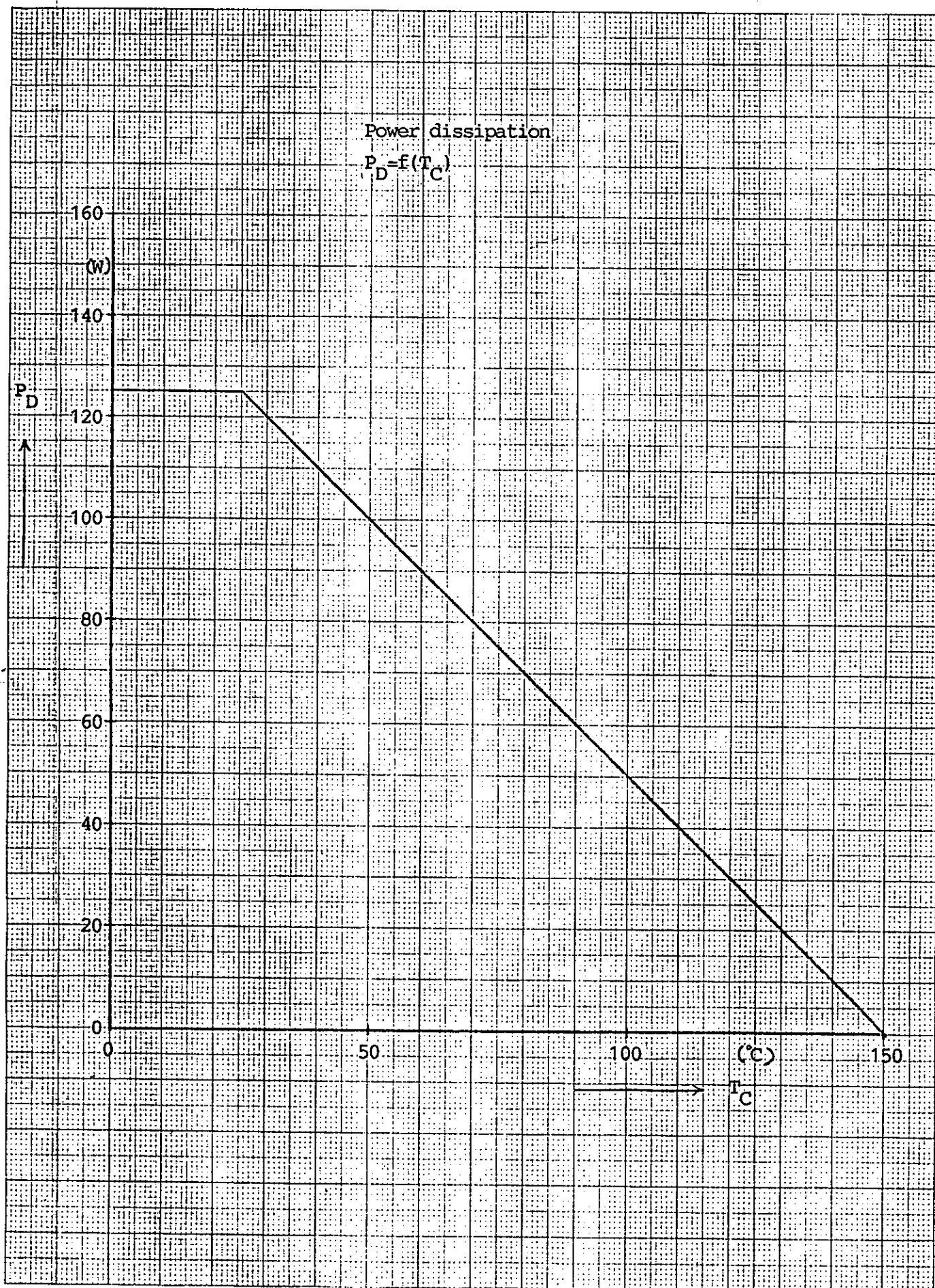
6. 御注意 (Attention)

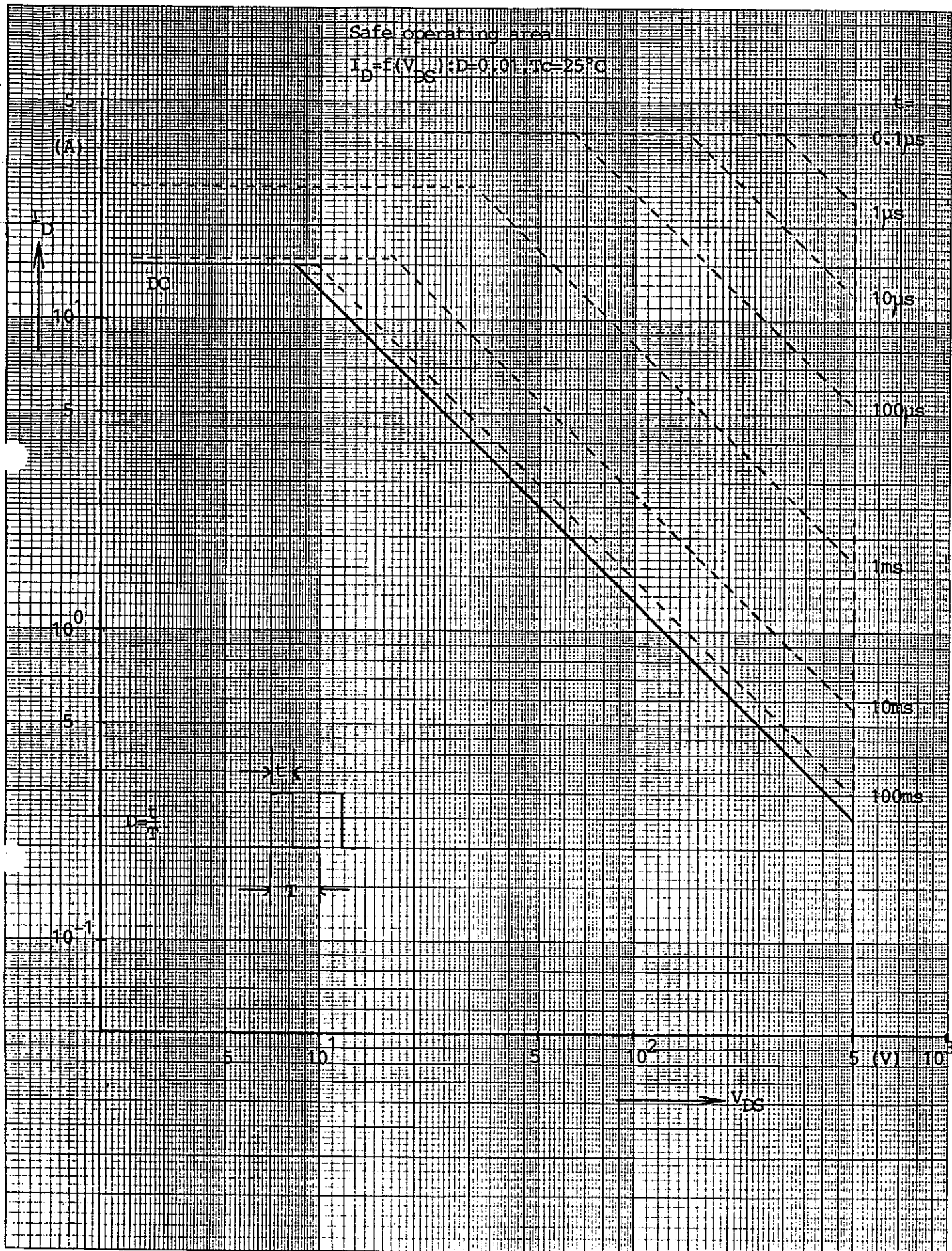
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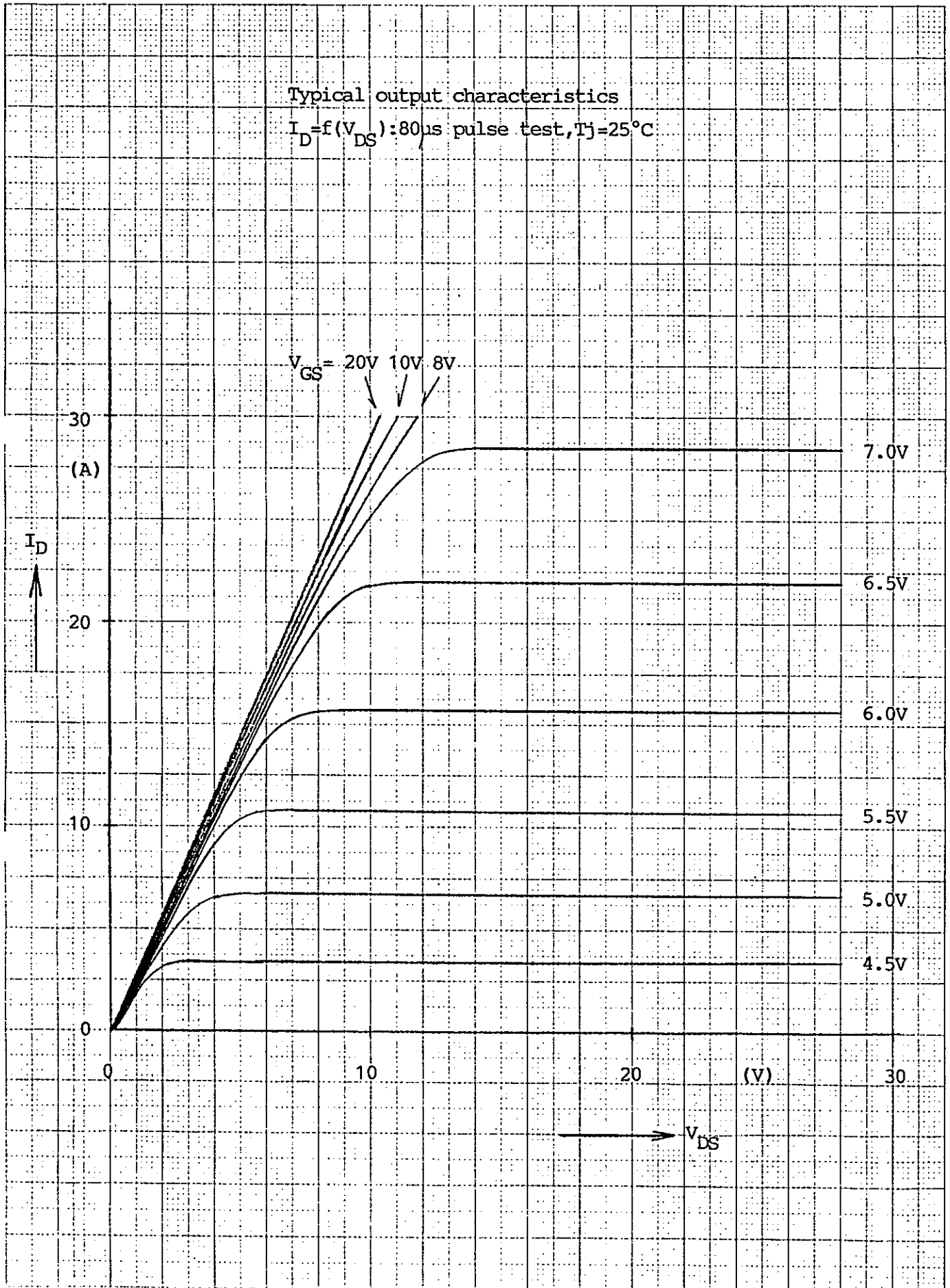




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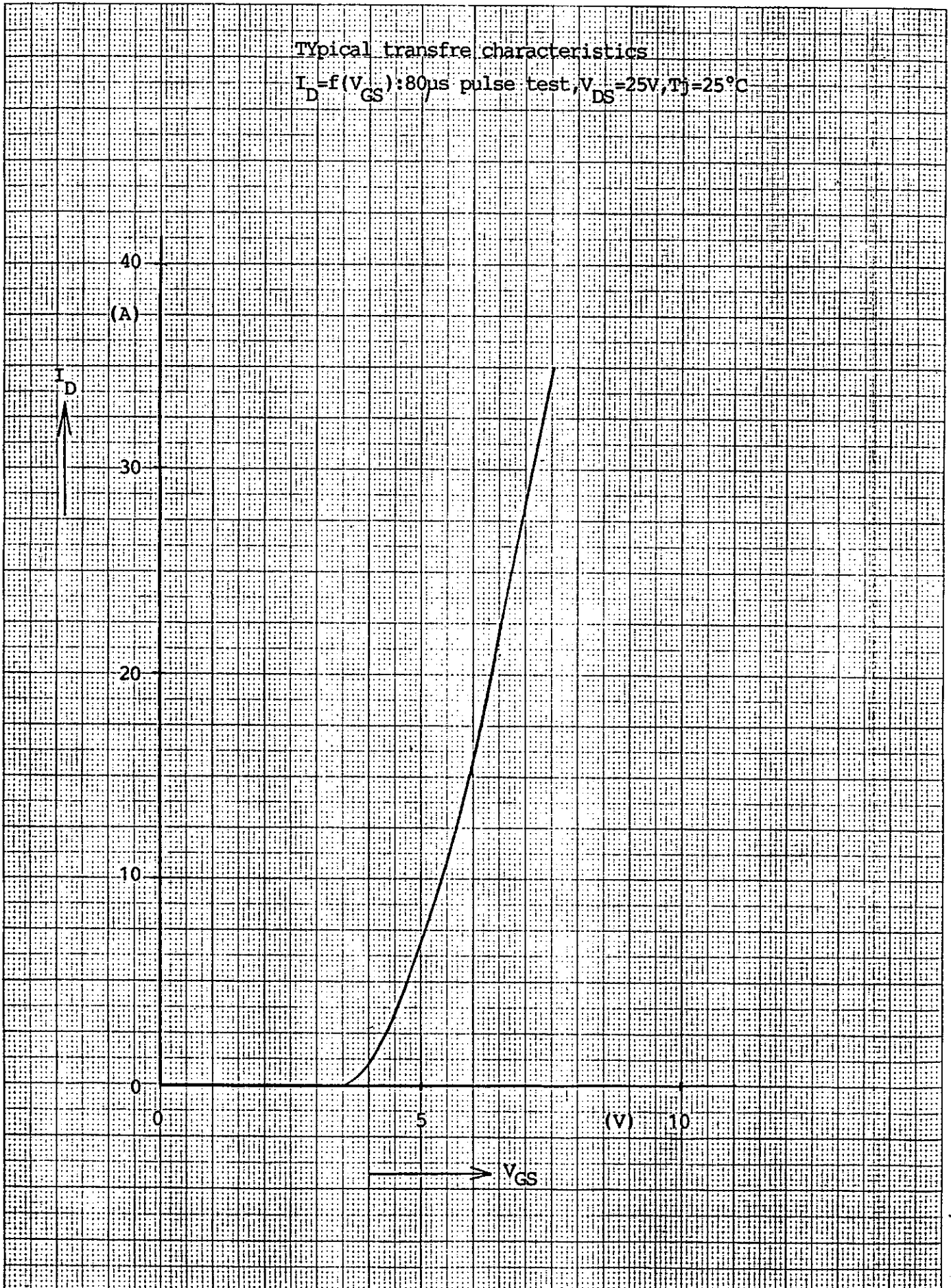
Typical output characteristics

$I_D = f(V_{DS})$: 80 μ s pulse test, $T_j = 25^\circ\text{C}$



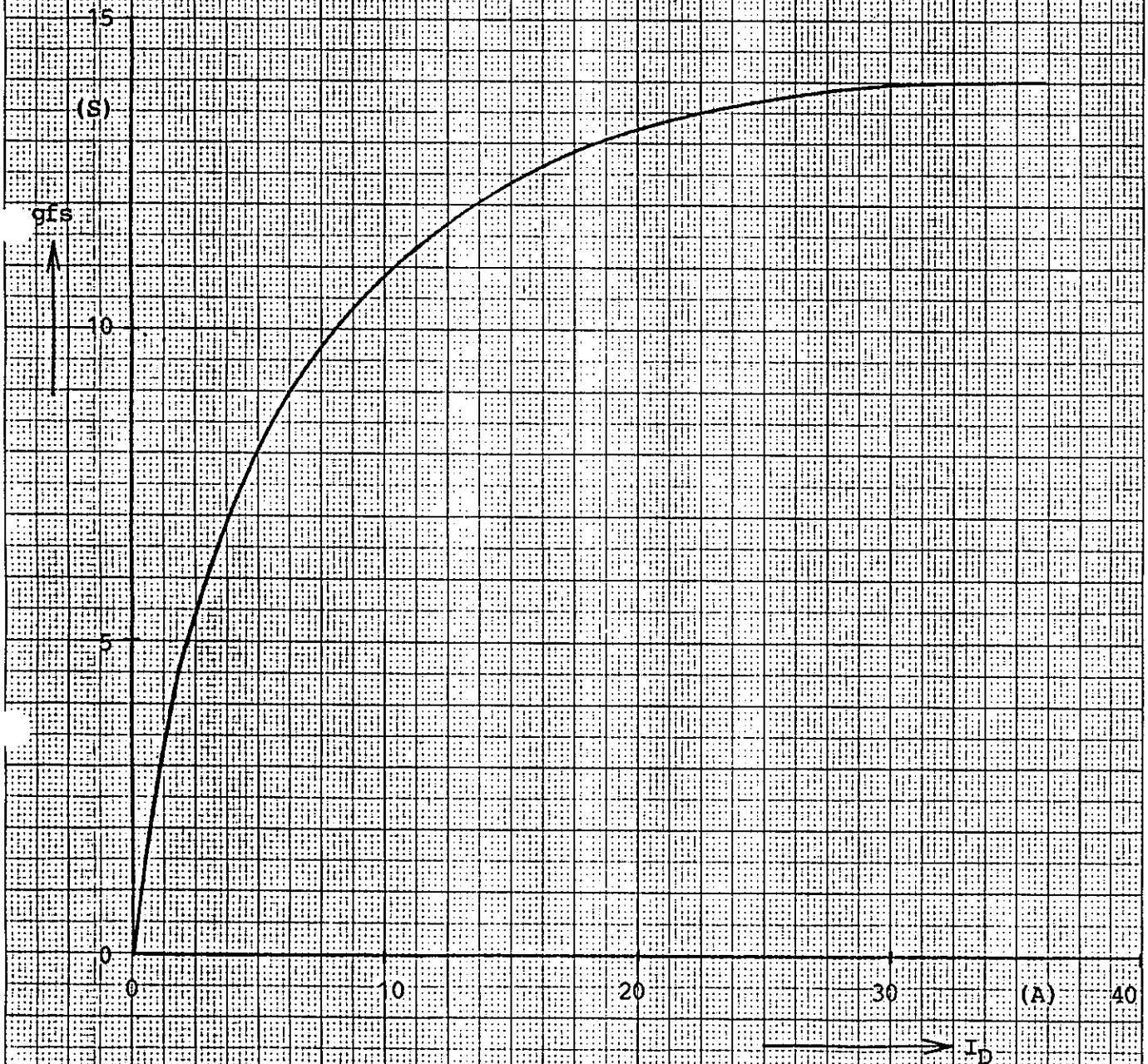
Typical transfre characteristics

$I_D = f(V_{GS})$: 80 μ s pulse test, $V_{DS} = 25V$, $T_j = 25^\circ C$



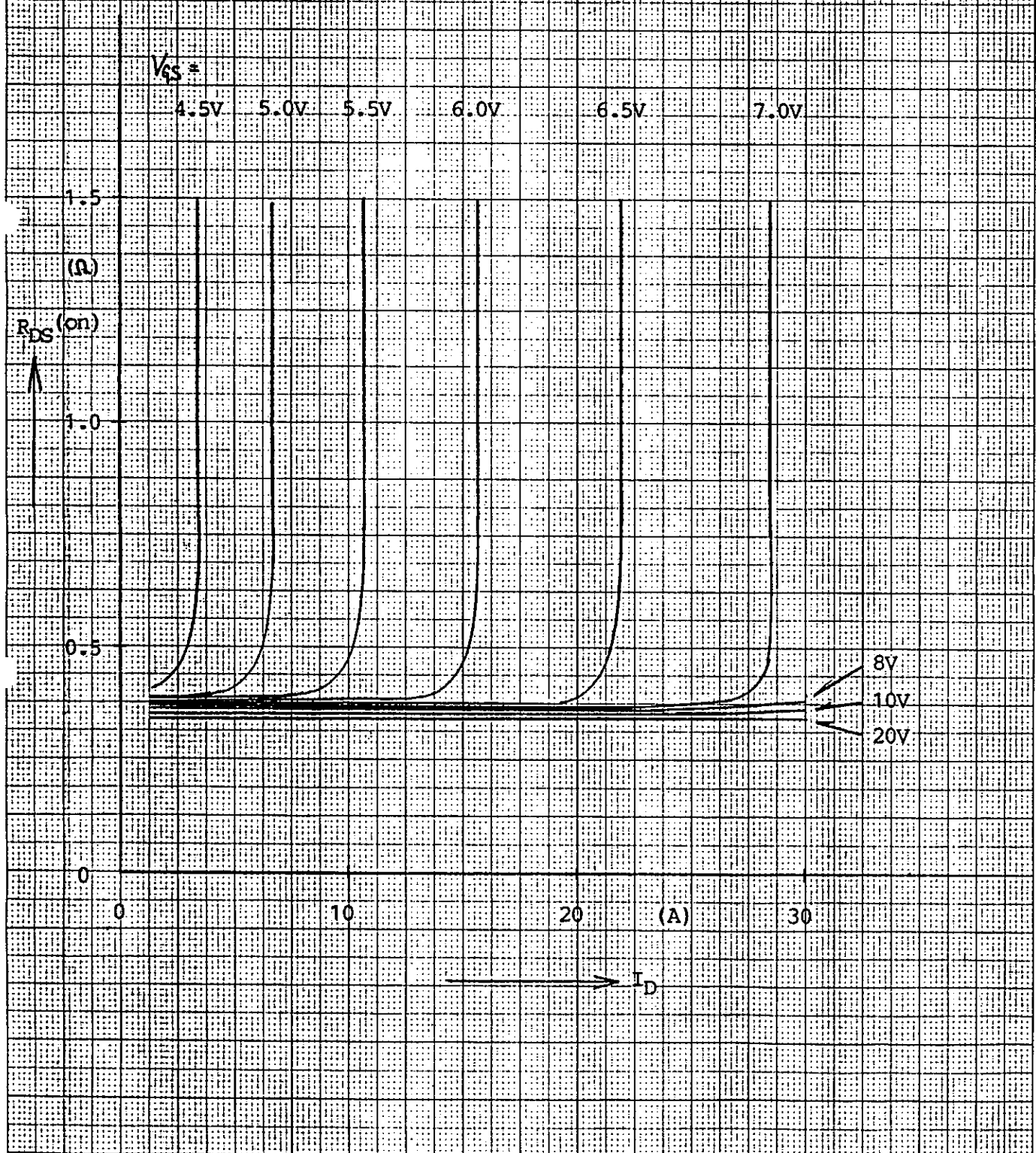
Typical transconductance

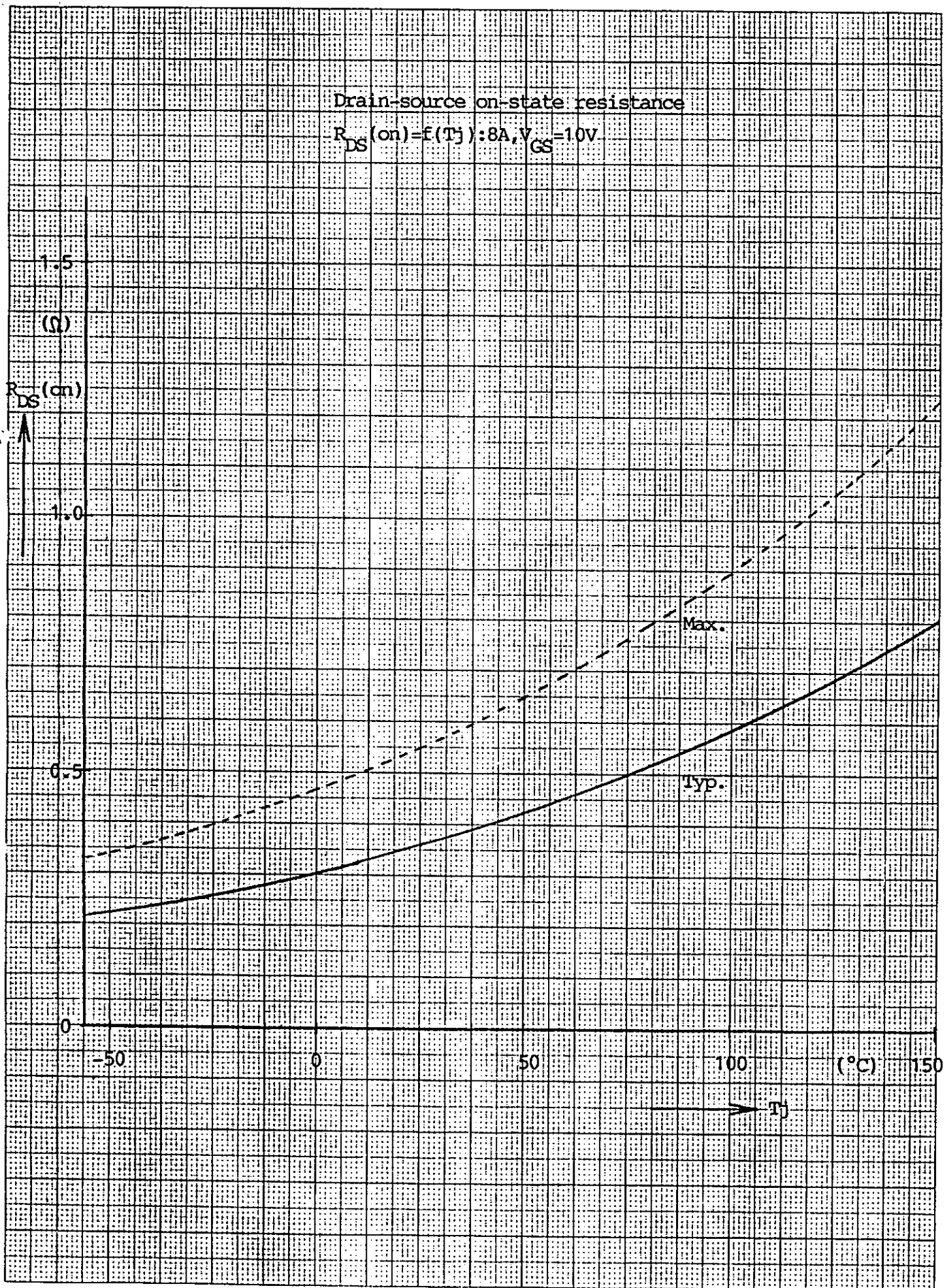
$g_{fs} = f(I_D)$: 80 μ s pulse test, $V_{DS} = 25V$, $T_J = 25^\circ C$



Typical drain-source on-state resistance

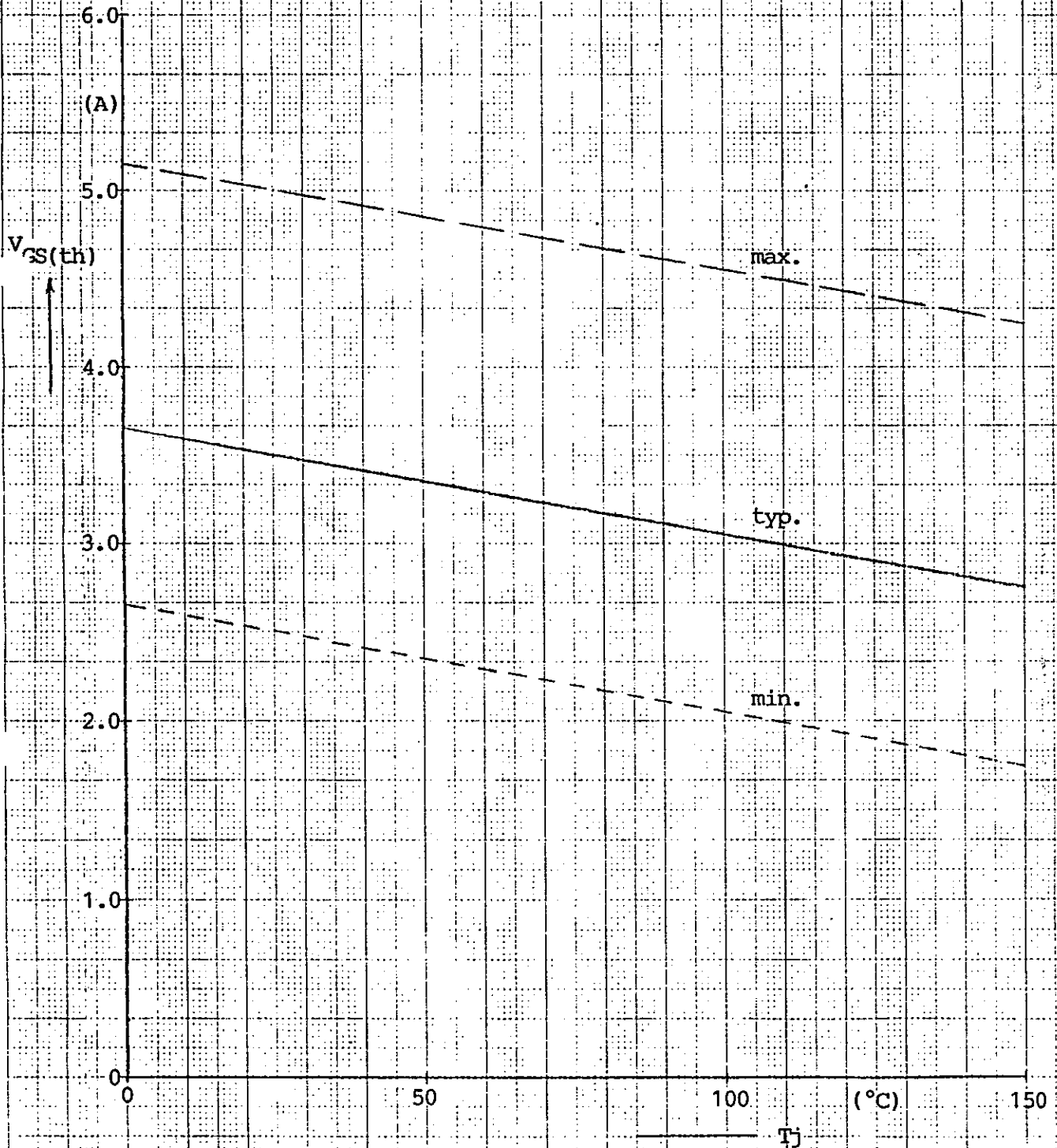
$$R_{DS(on)} = f(I_D, V_{GS}, T_j = 25^\circ\text{C})$$





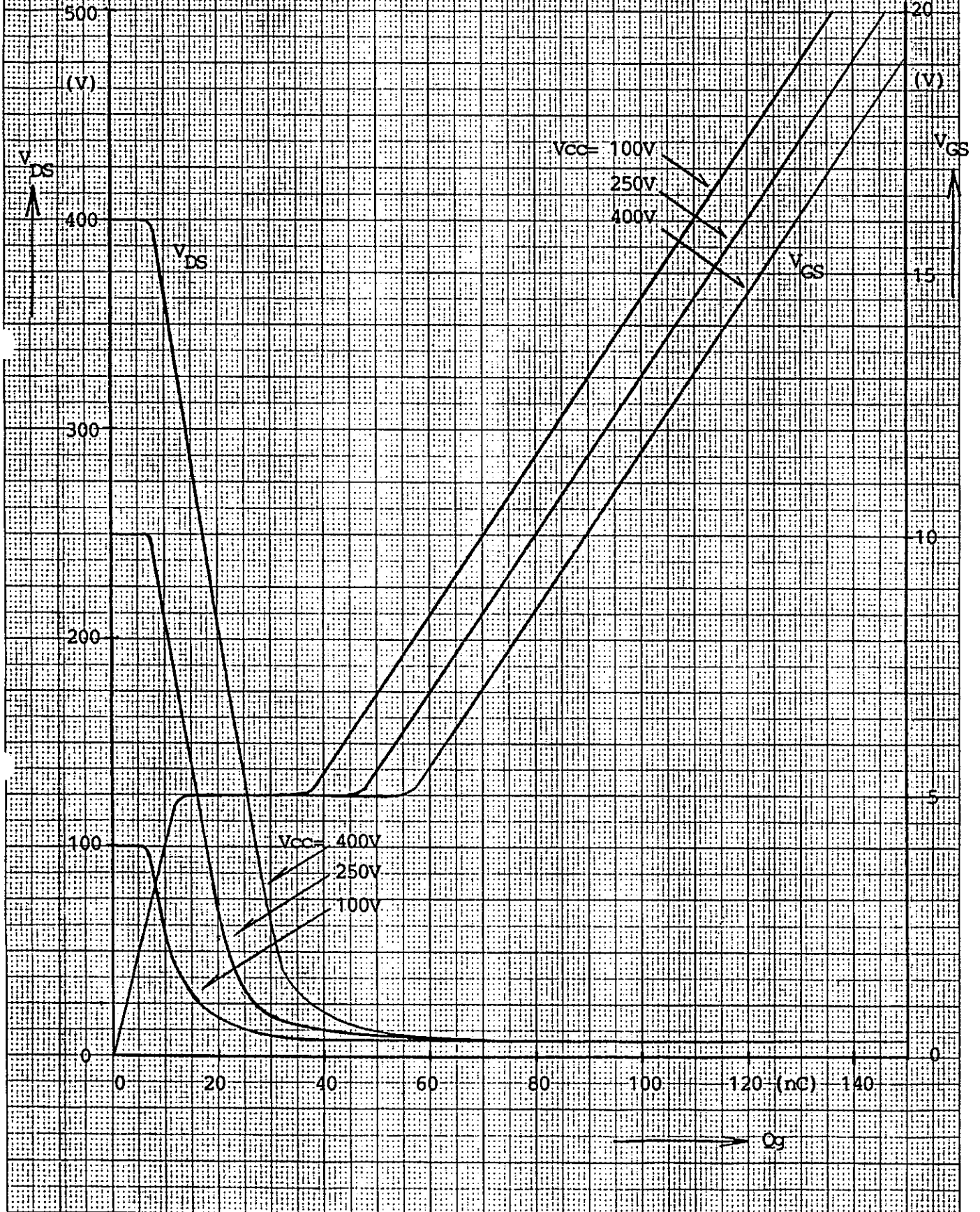
Gate threshold voltage

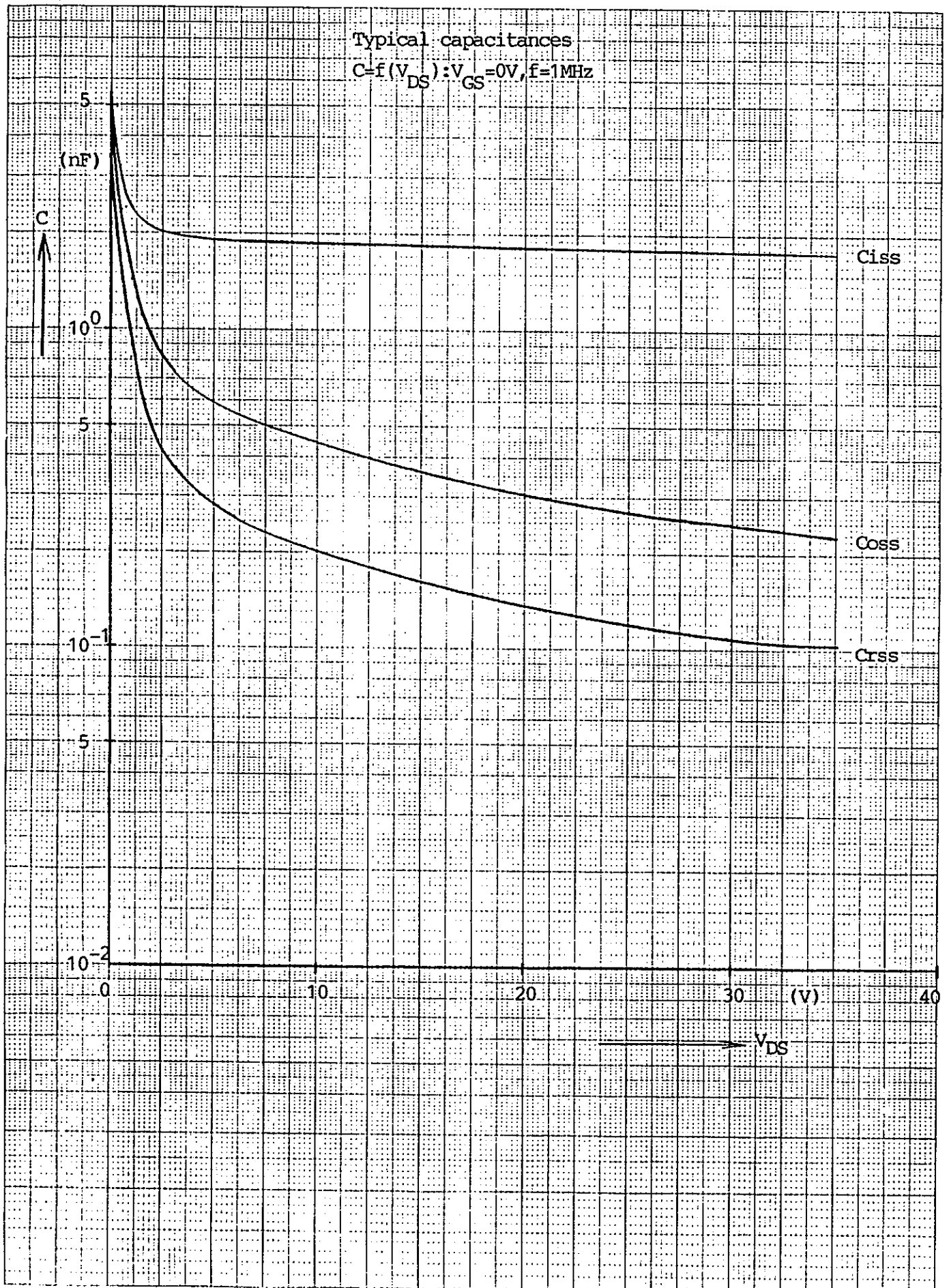
$$V_{GS(th)} = f(T_j): I_D = 1\text{mA}, V_{DS} = V_{GS}$$



Typical gate charge characteristics

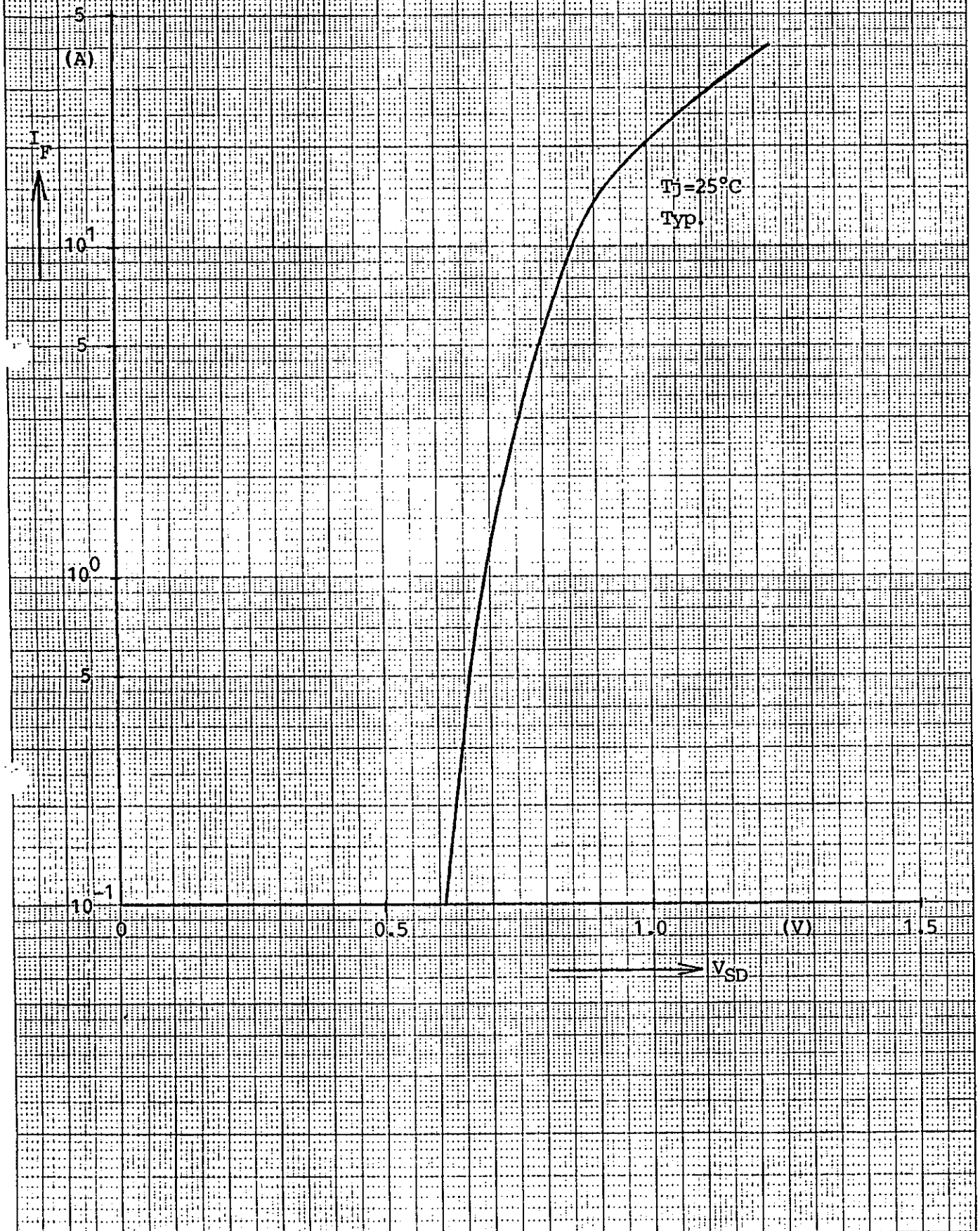
$$V_{GS} = f(Q_g); I_D = 15A$$



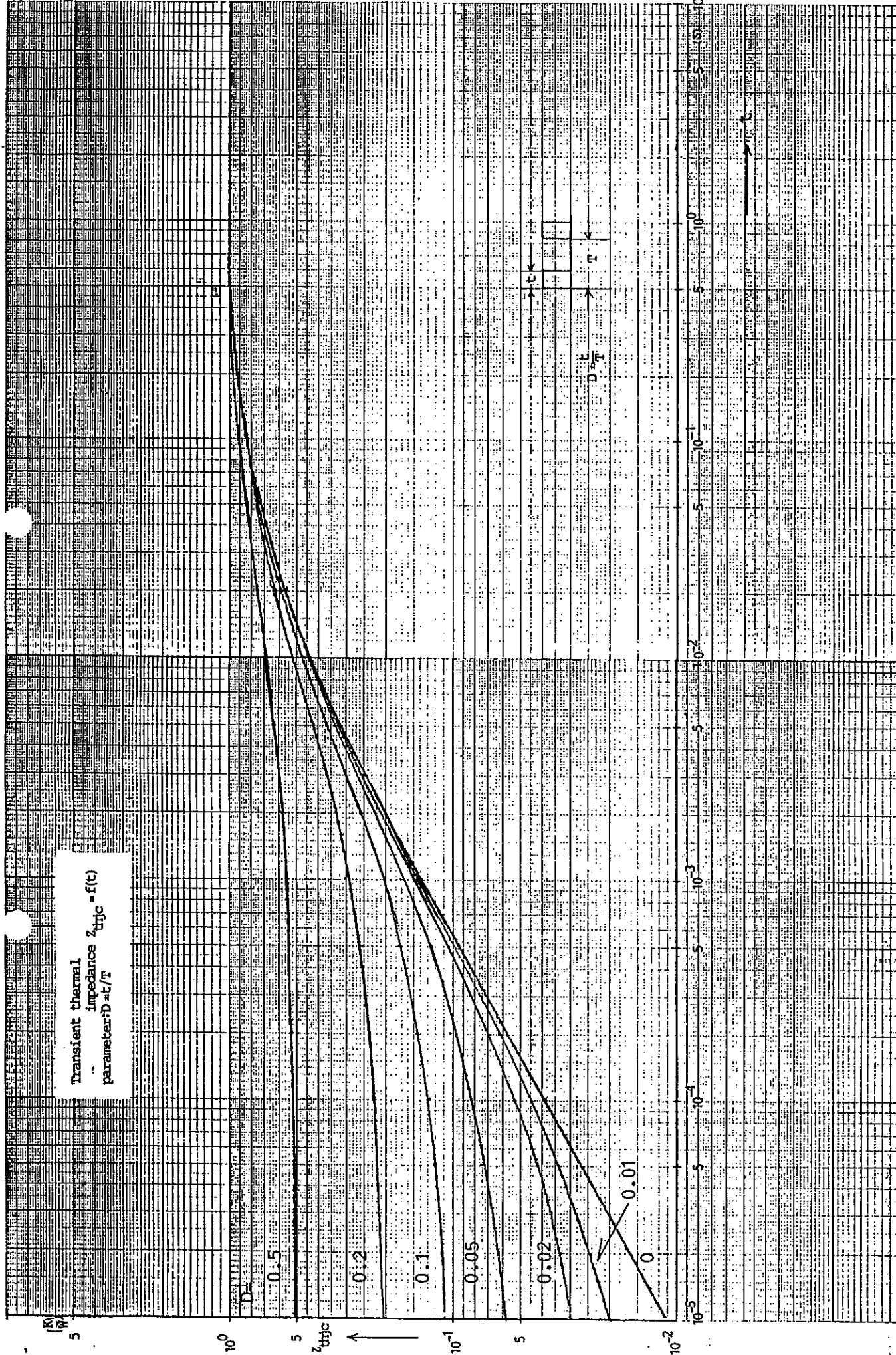


Forward characteristic of reverse diode

$I_F = f(V_{SD})$: 80 μ s pulse test

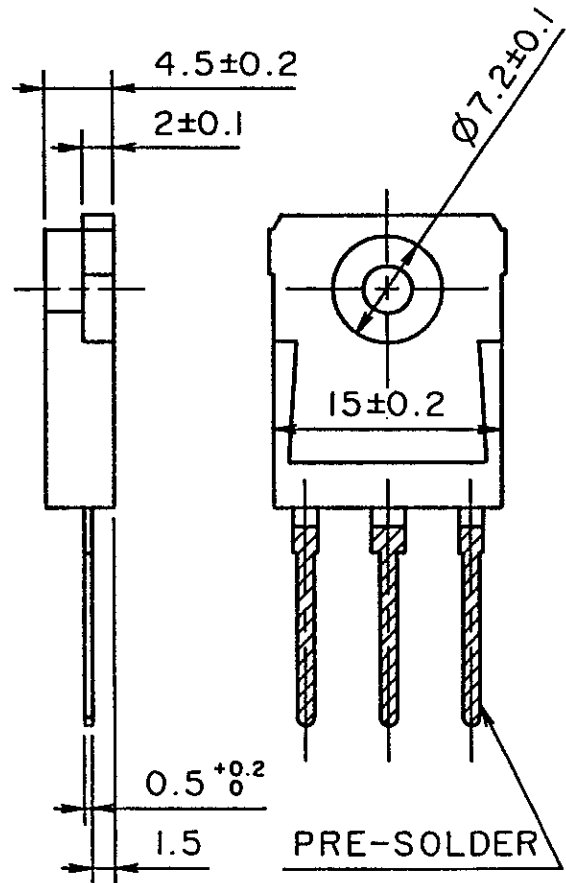
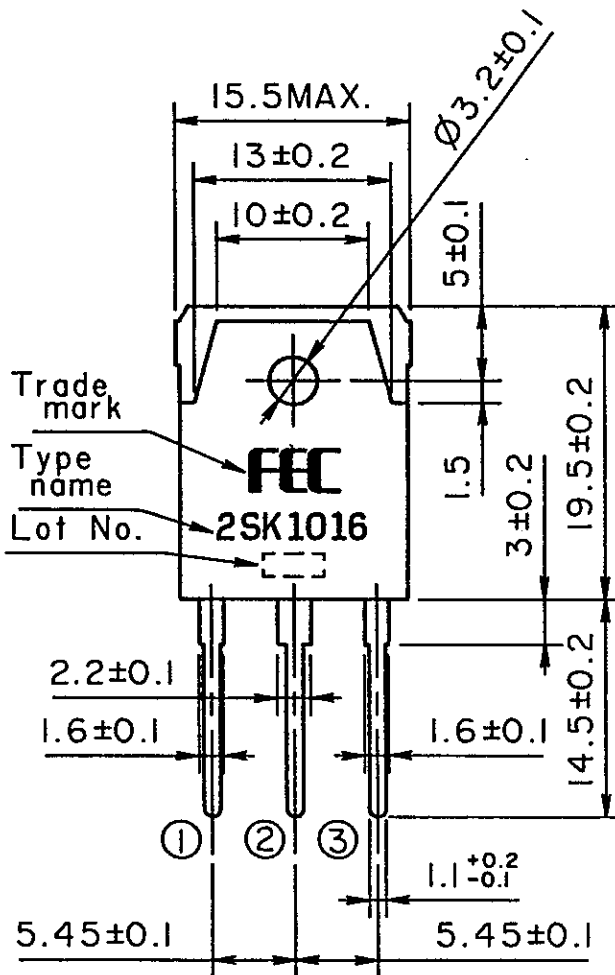


Transient thermal
impedance $z_{thjc} = f(t)$
parameter: $D = t/T$



FUJI POWER MOS FET

TYPE : 2SK1016



DIMENSIONS ARE IN MILLIMETERS.

CONNECTION

- ① GATE
- ② DRAIN
- ③ SOURCE

JEDEC : TO-228AA

EIAJ : SC-65

MS.T03P.2SK1016

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