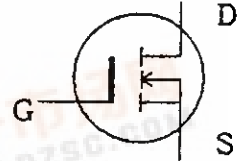


Fuji power MOSFET Specification

2SK1018

1. Scope
This specifies Fuji power MOSFET 2SK1018

2. Outline
 I) Construction N-channel enhancement mode power MOSFET
 II) Application for switching
 III) Outview T0-3P (MK5C24562)



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	18	A	
Pulsed drain current	I_{Dpulse}	44	A	
Gate-source voltage	V_{GS}	± 30	V	
Maximum power dissipation	P_D	125	W	
Operating and storage temperature range	T_{ch}	150	$^\circ\text{C}$	
	T_{stg}	-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	$B V_{DSS}$	$I_D = 1\text{mA}$ $V_{GS} = 0\text{V}$	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}	$V_{DS} = 500\text{V}$ $V_{GS} = 0\text{V}$	$T_{ch} = 25^\circ\text{C}$	10	500	μA
	I_{DSS}			$T_{ch} = 125^\circ\text{C}$	0.2	1.0
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	$R_{DS(on)}$	$I_D = 8\text{A}$ $V_{GS} = 10\text{V}$		0.30	0.45	Ω

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Dynamic ratings

Description	Symbol	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Forward transconductance	g_{fs}	$I_D = 8A$ $V_{DS} = 25V$	5.0	10		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	180	pF
Turn-on time	$t_{d(on)}$	$V_{CC} = 300V$ $V_{GS} = 10V$ $I_D = 18A$ $R_{GS} = 25\Omega$		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}	$T_C = 25^\circ C$			18	A
Pulsed reverse deain current	I_{DRM}	$T_C = 25^\circ C$			44	A
Diode forward on-voltage	V_{SD}	$I_F = 2 \times I_{DR}$ $V_{GS} = 0V, T_{ch} = 25^\circ C$		1.18	1.70	V
Reverse recovery time	t_{rr}	$I_F = I_{DR}$ $dI_F/dt = 100A/\mu S$ $T_{ch} = 25^\circ C$		500		ns
Reverse recovery charge	Q_{rr}			4.5		μC

5. Thermal resistance

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

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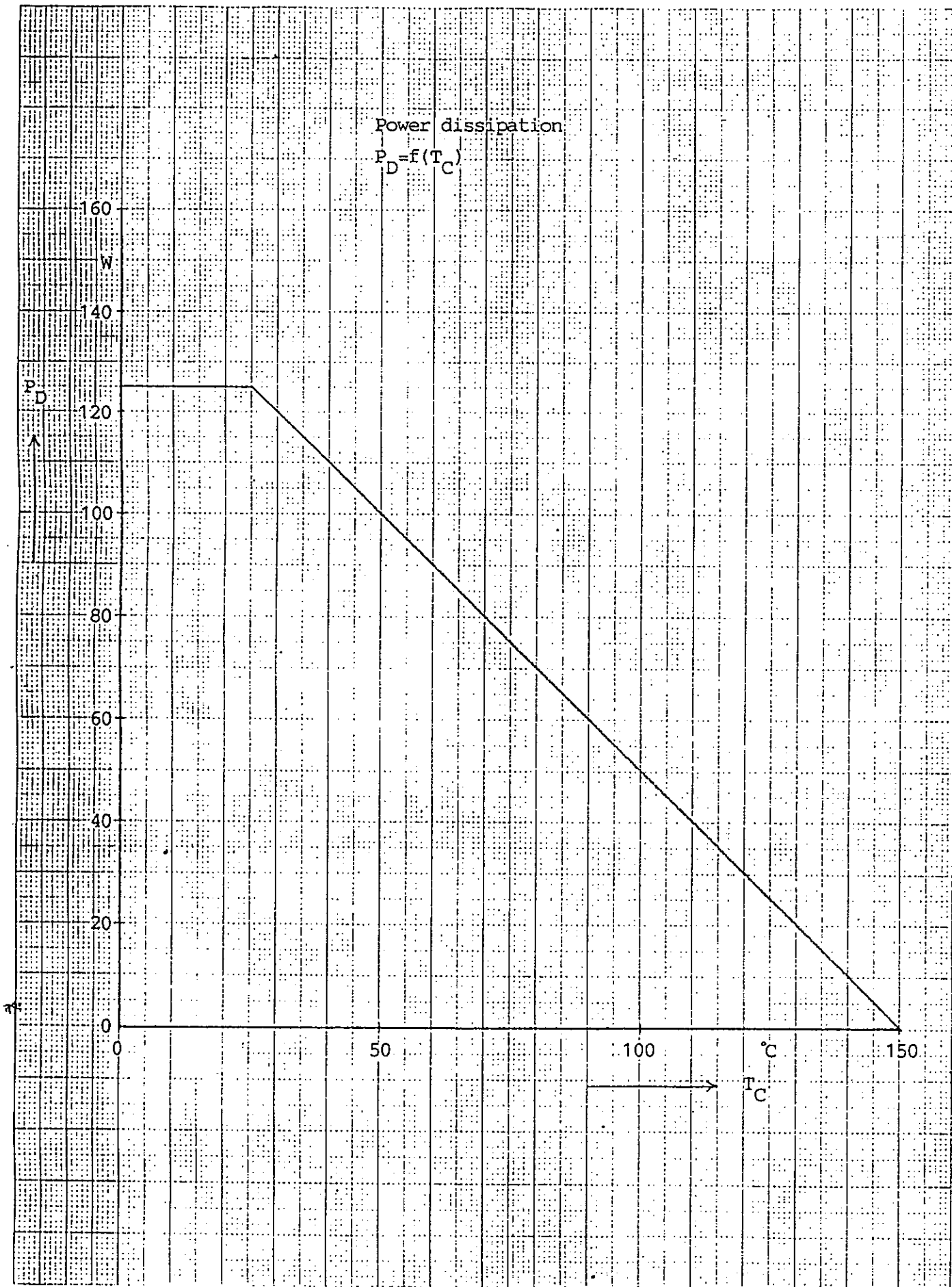
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This product described in this specification contain strategic product subject to COCOM requirements. They should not be exported without authorization from the appropriate governmental authorities.

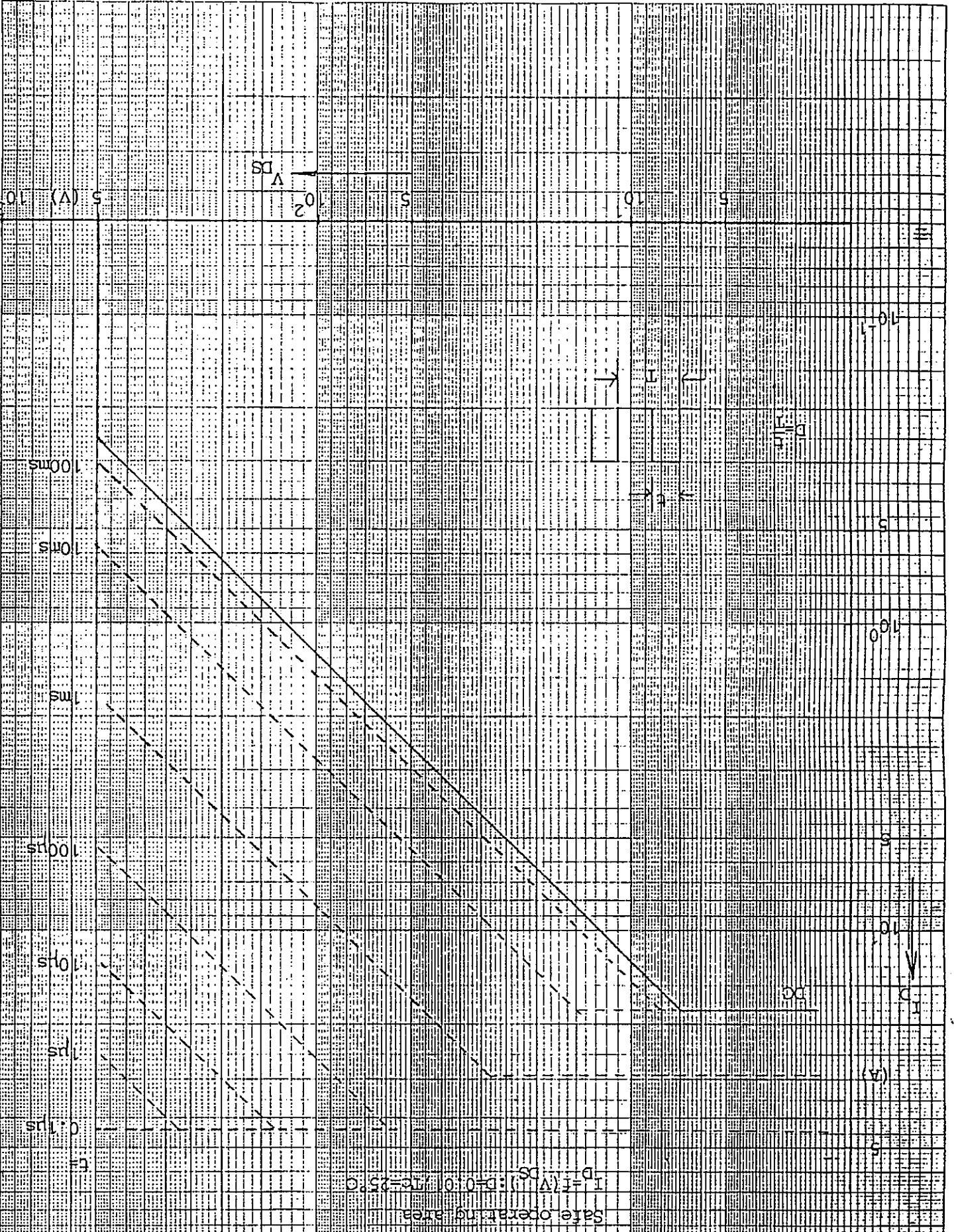
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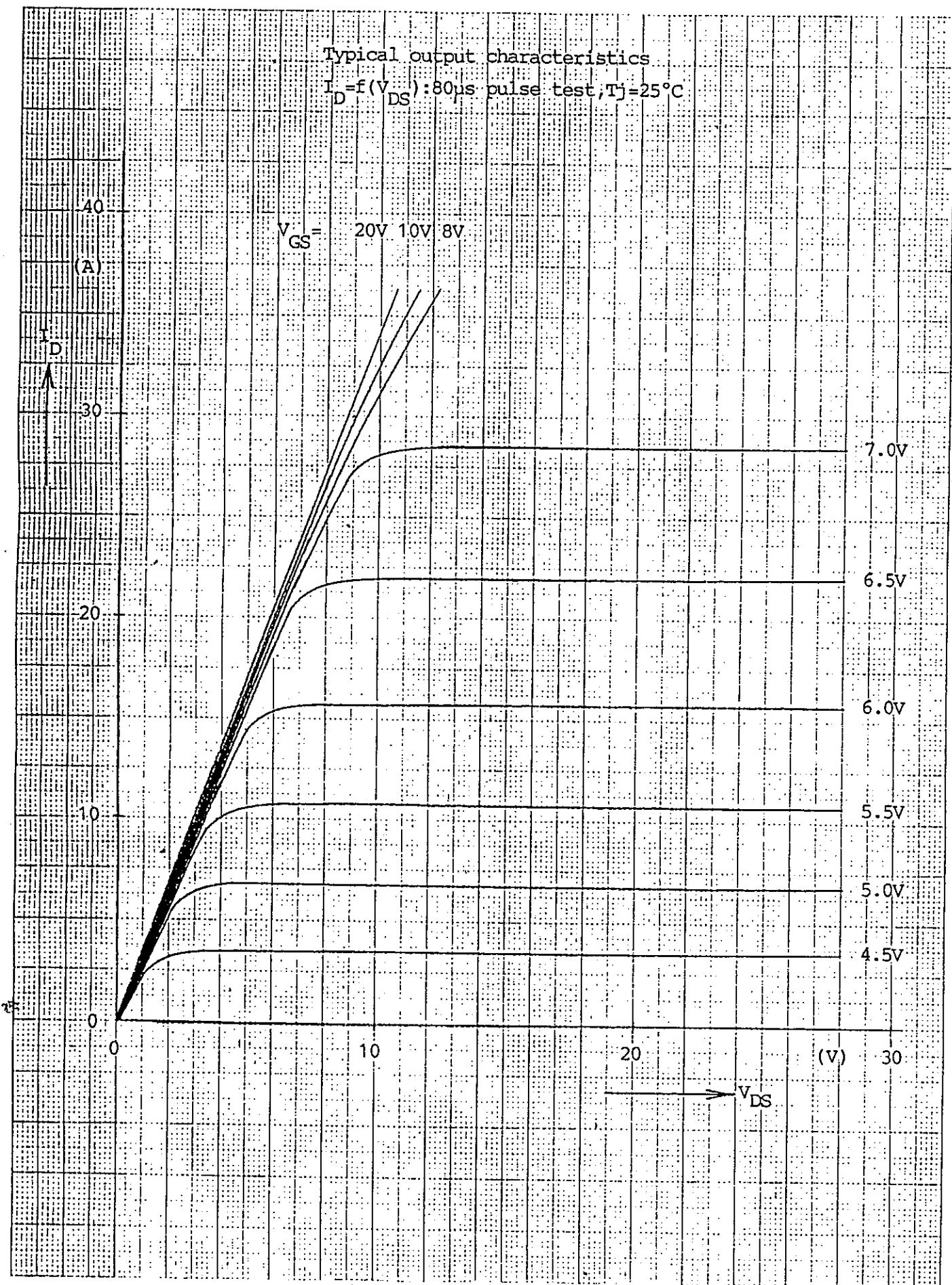
11 2 11



Safe operating area
 $I_D = f(V_{DS})$; $V_{GS} = 10V$; $V_{DS} = 25V$; $T_c = 25^\circ C$

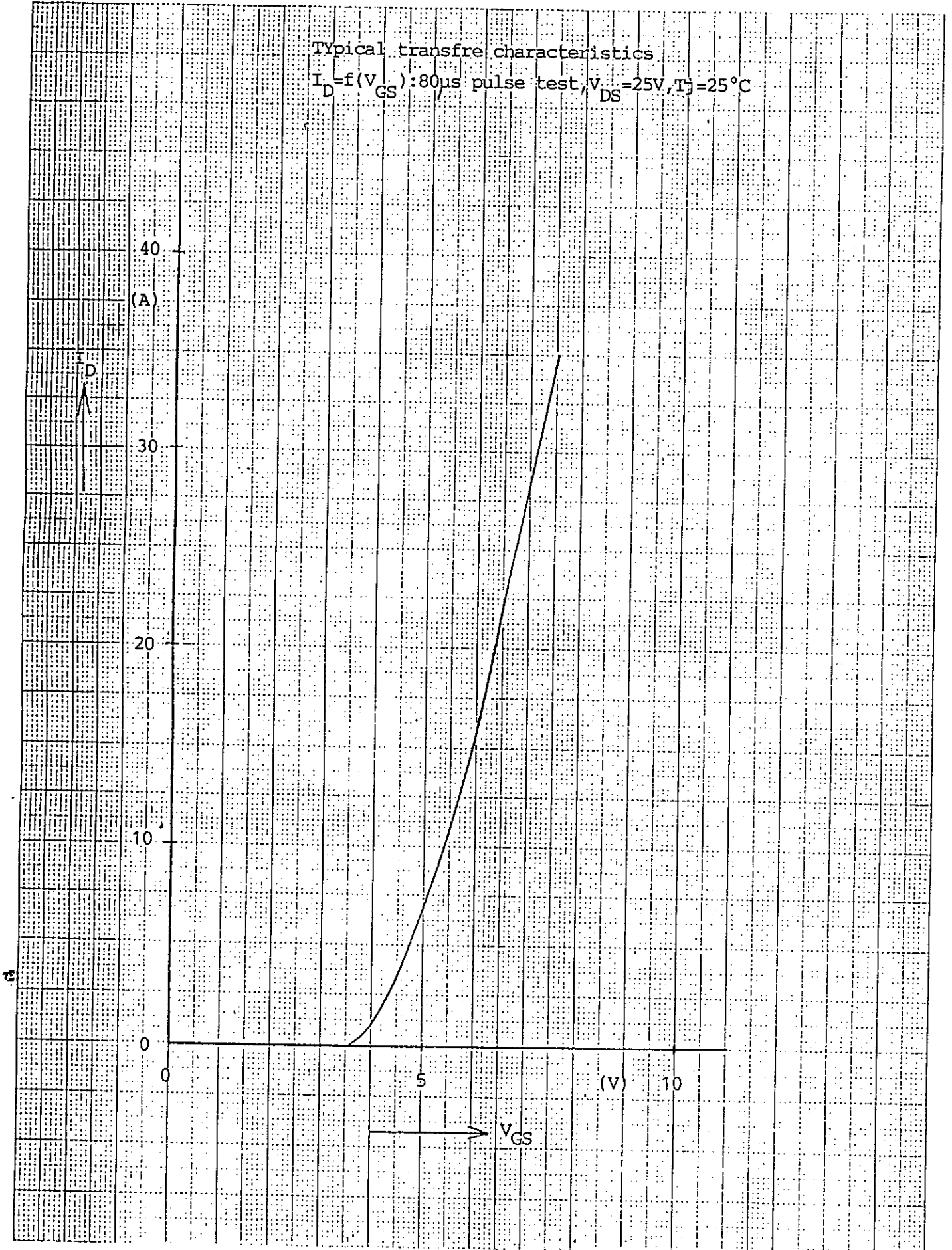
Typical output characteristics

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

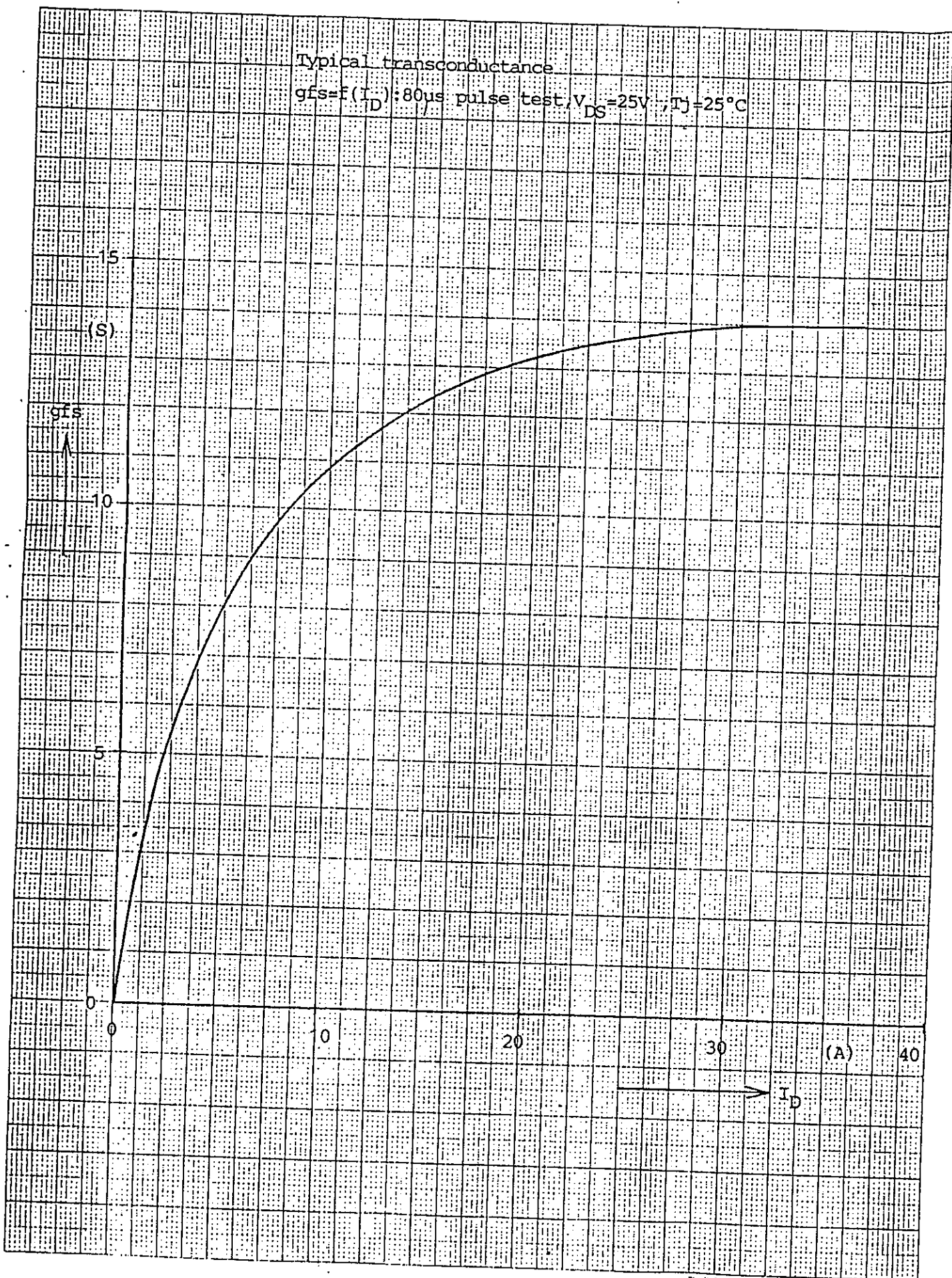


Typical transfre characteristics

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

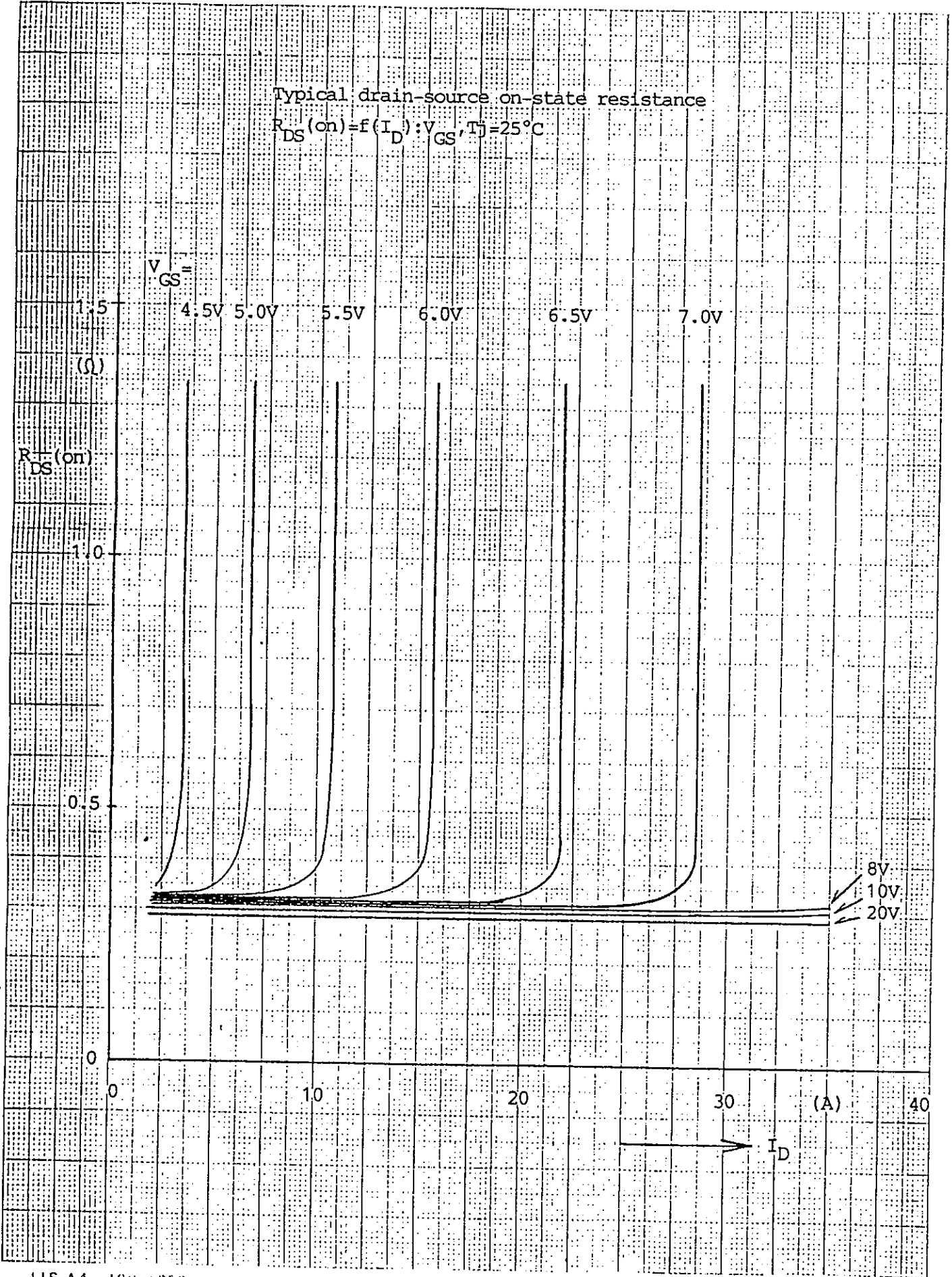


Typical transconductance
 $g_{fs} = f(I_D)$: 80 μ s pulse test, $V_{DS} = 25V$, $T_J = 25^\circ C$



Typical drain-source on-state resistance

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



Drain-source on-state resistance

$$R_{DS(on)} = f(T_J) : I_D = 8A, V_{GS} = 10V$$

1.5
(Ω)

$R_{DS(on)}$

1.0

0.5

0

-50

0

50

100

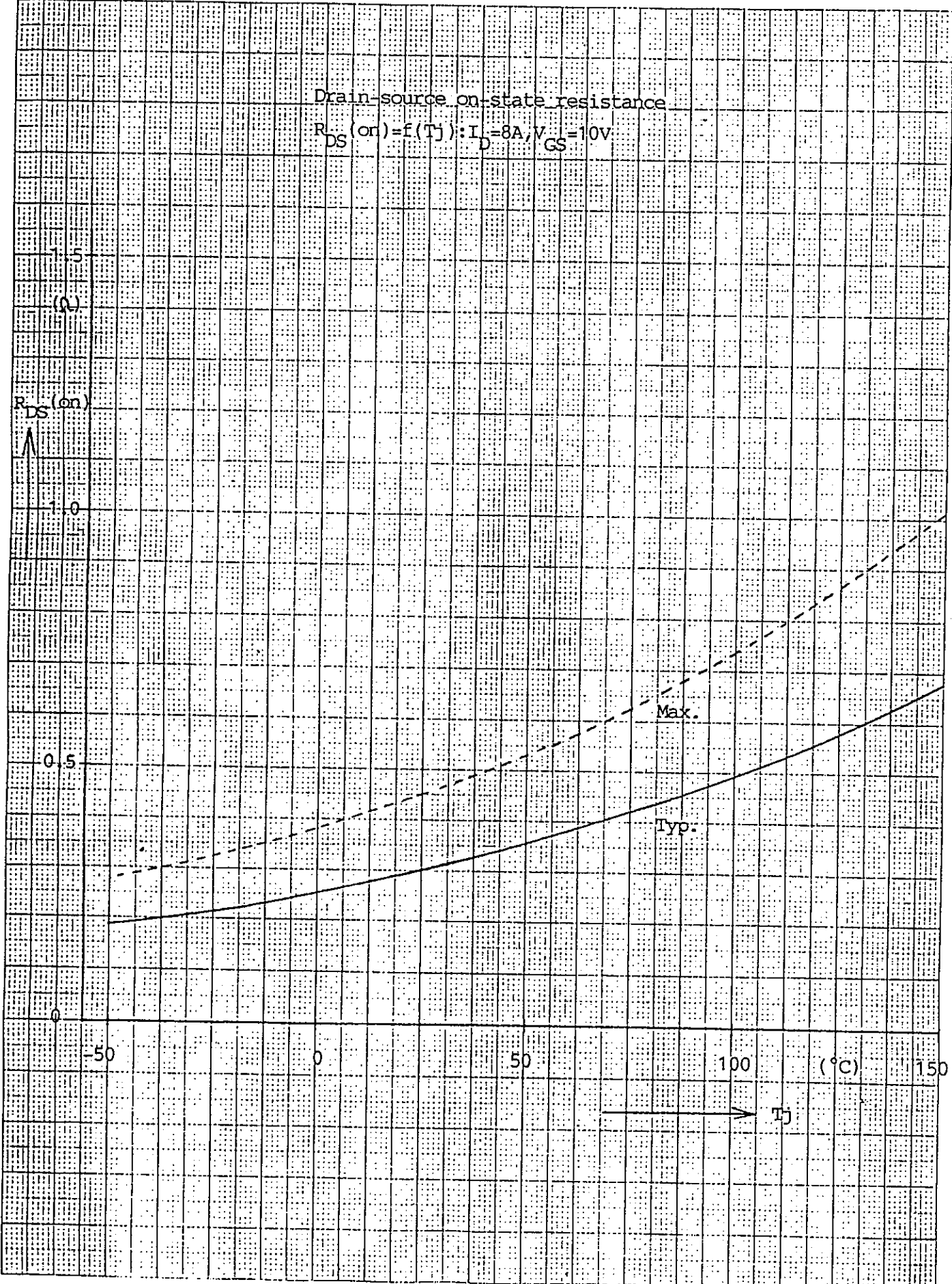
($^{\circ}C$)

150

Max.

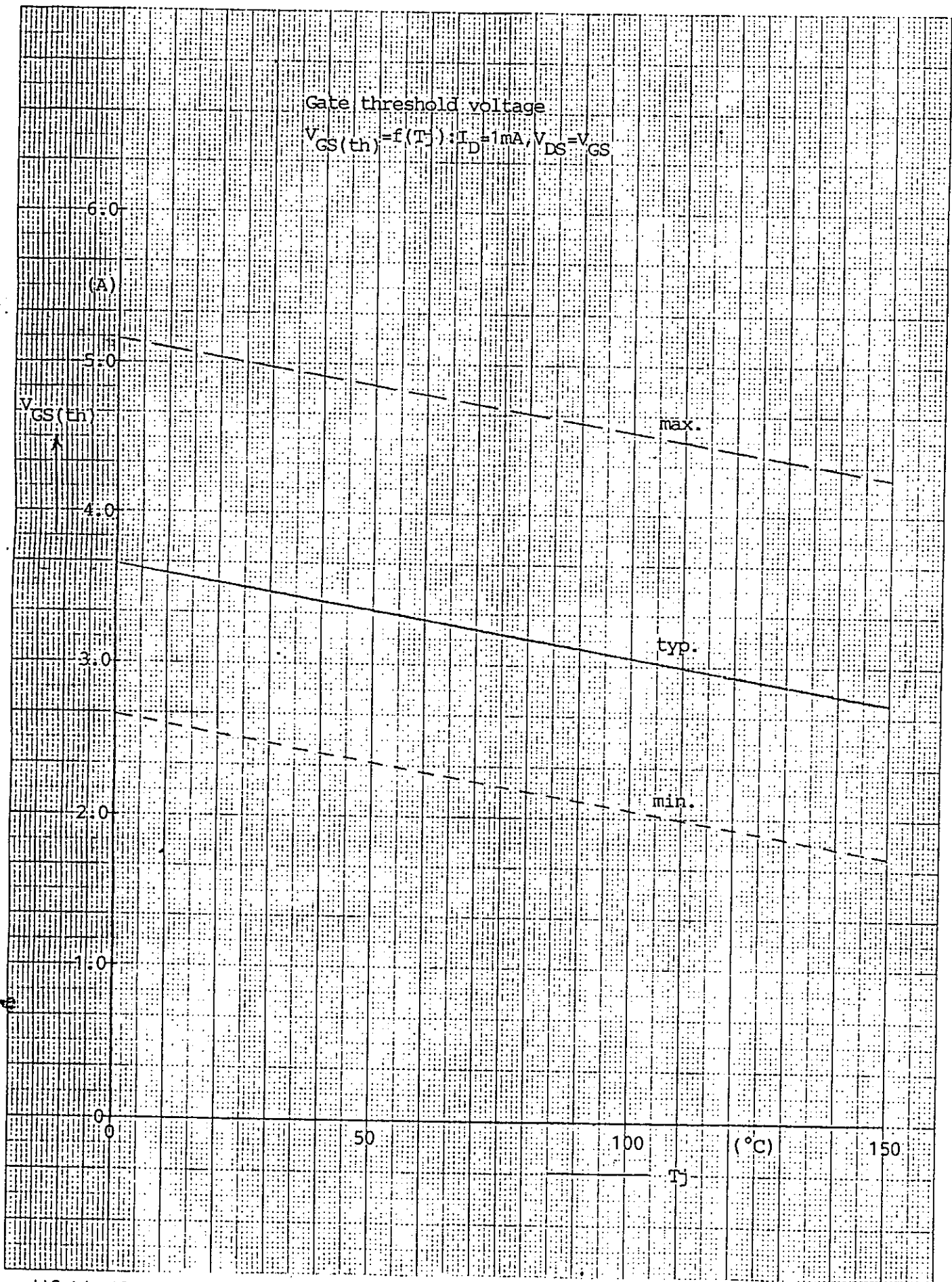
Typ.

T_J



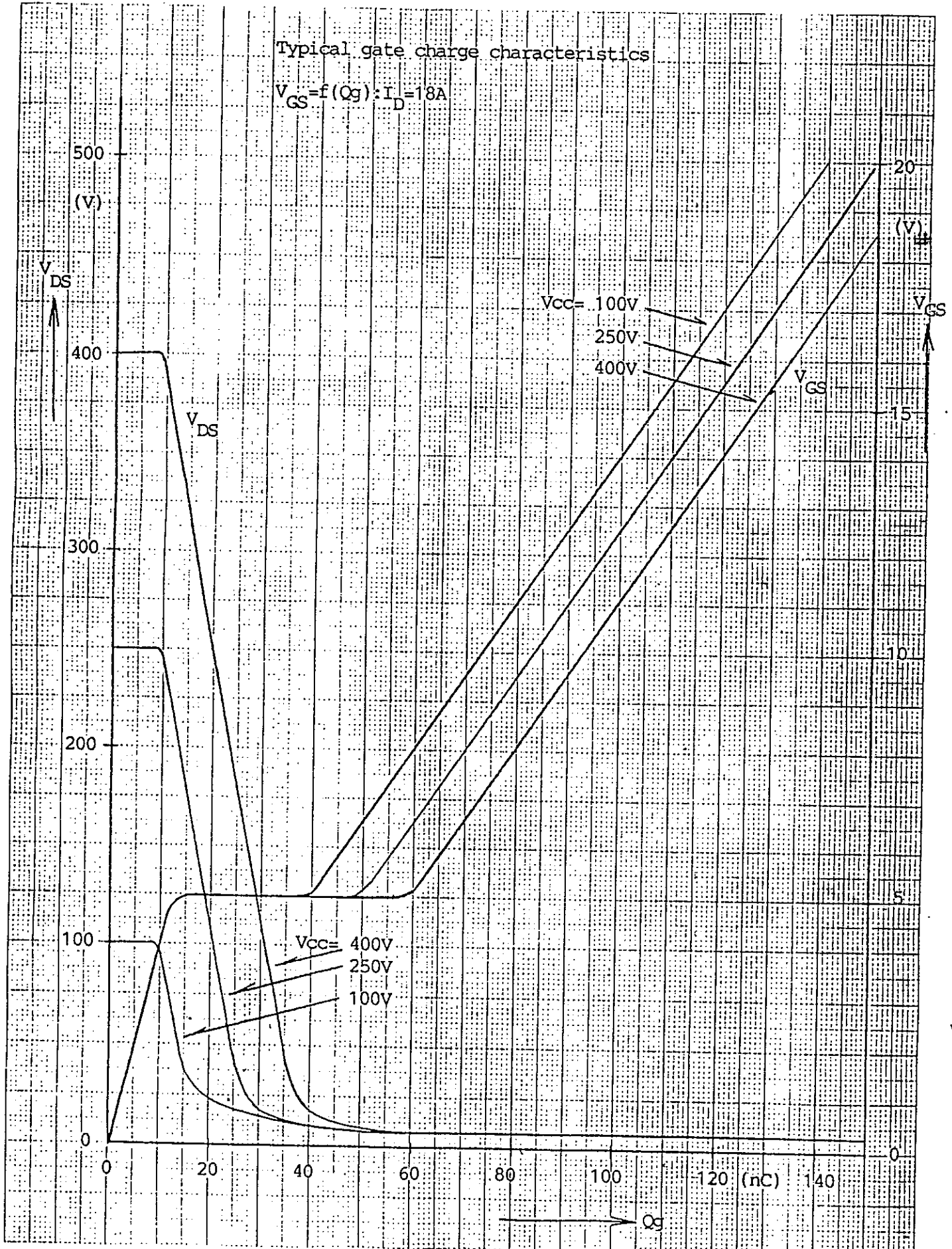
Gate threshold voltage

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

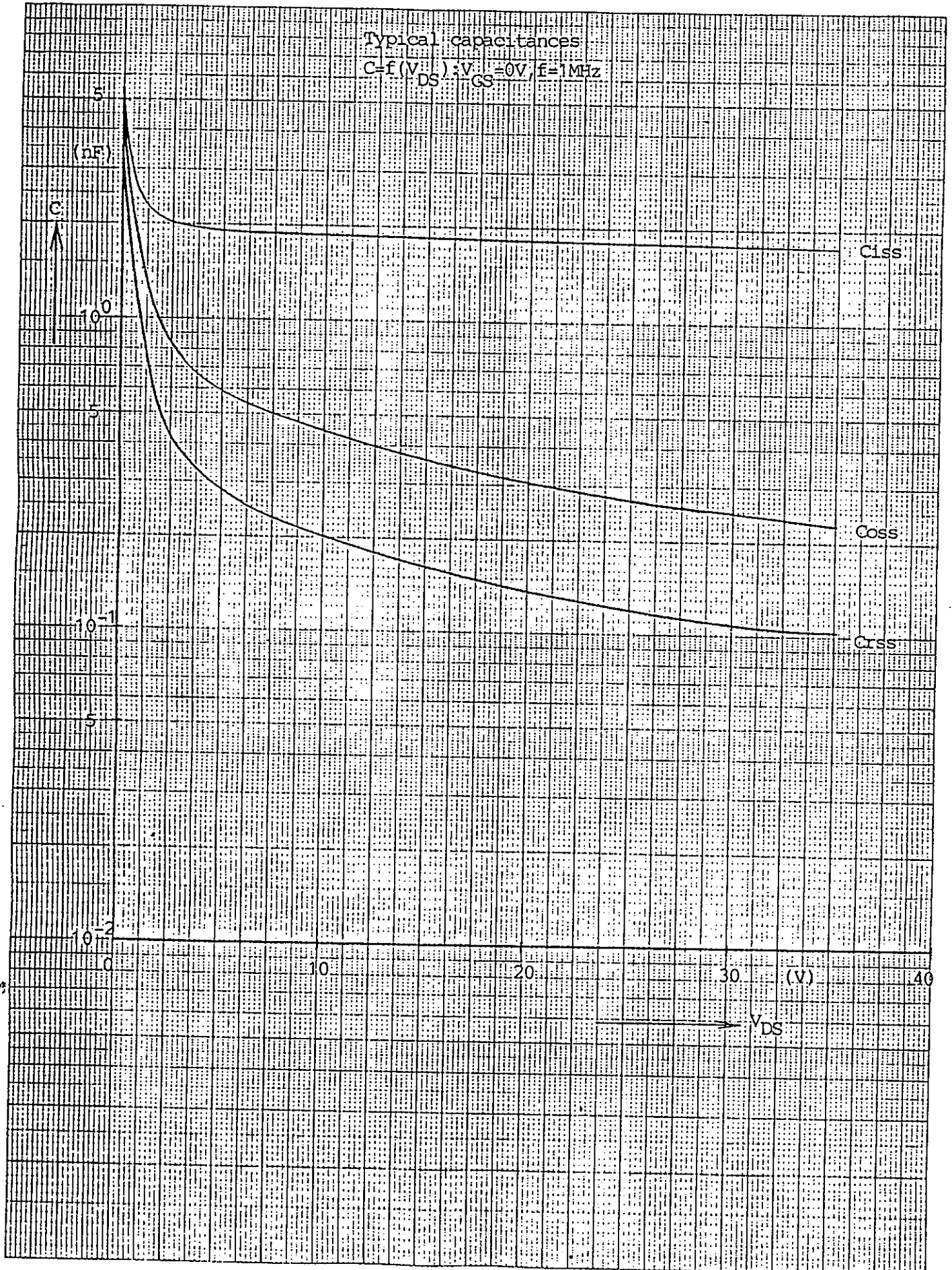


Typical gate charge characteristics

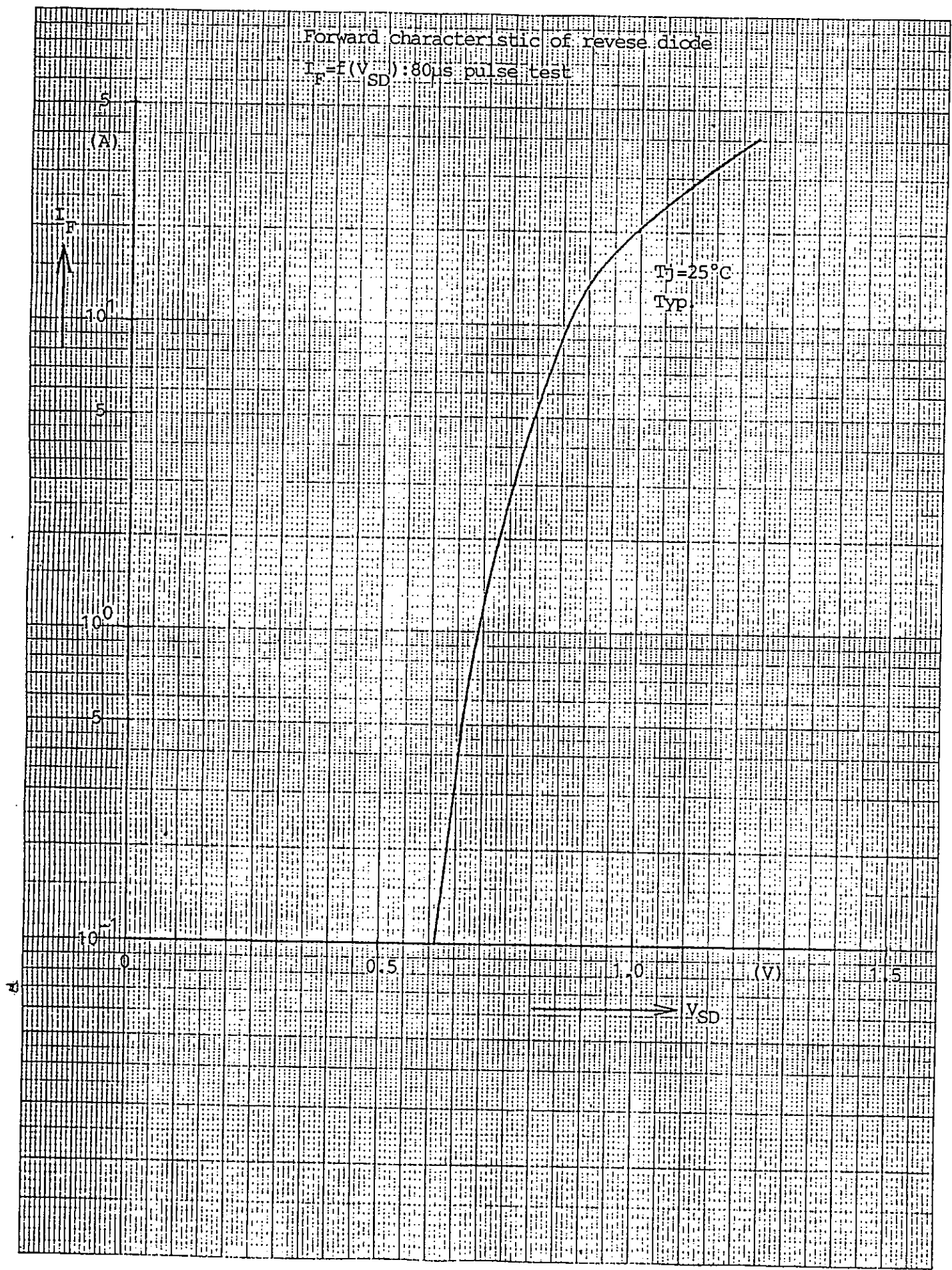
$V_{GS} = f(Q_g) : I_D = 18A$



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



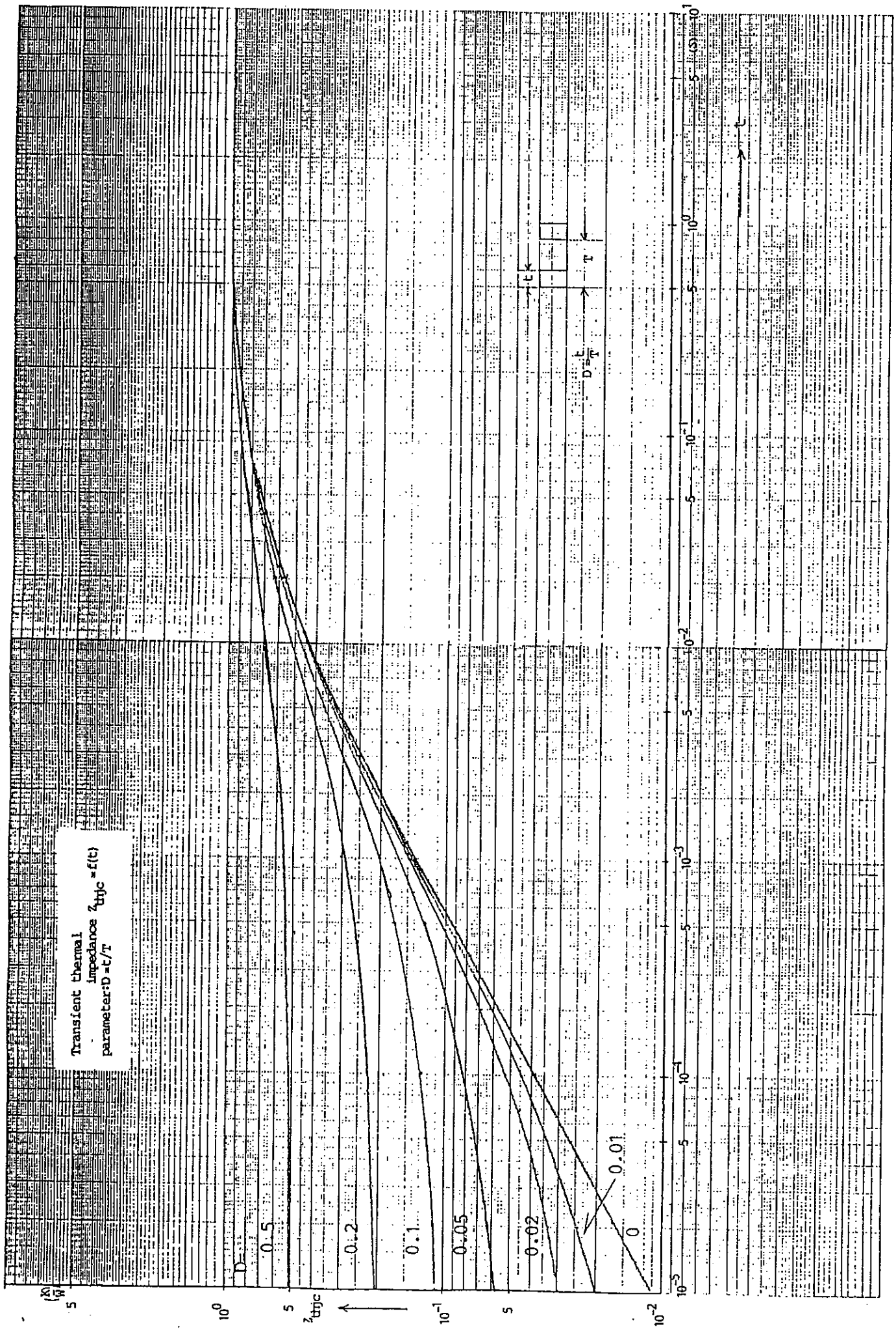
Forward characteristic of reverse diode
 $I_F = f(V_{SD})$: 80 μ s pulse test



$T_j = 25^\circ\text{C}$
Typ.

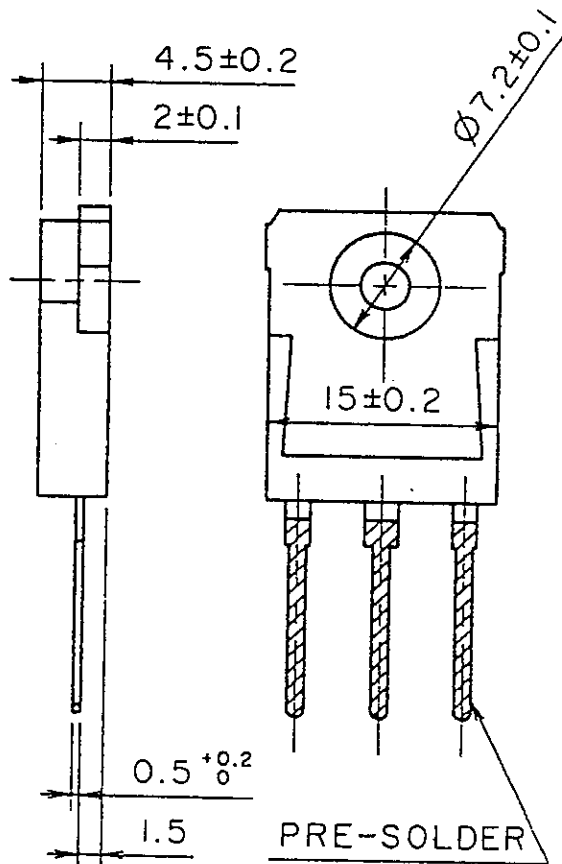
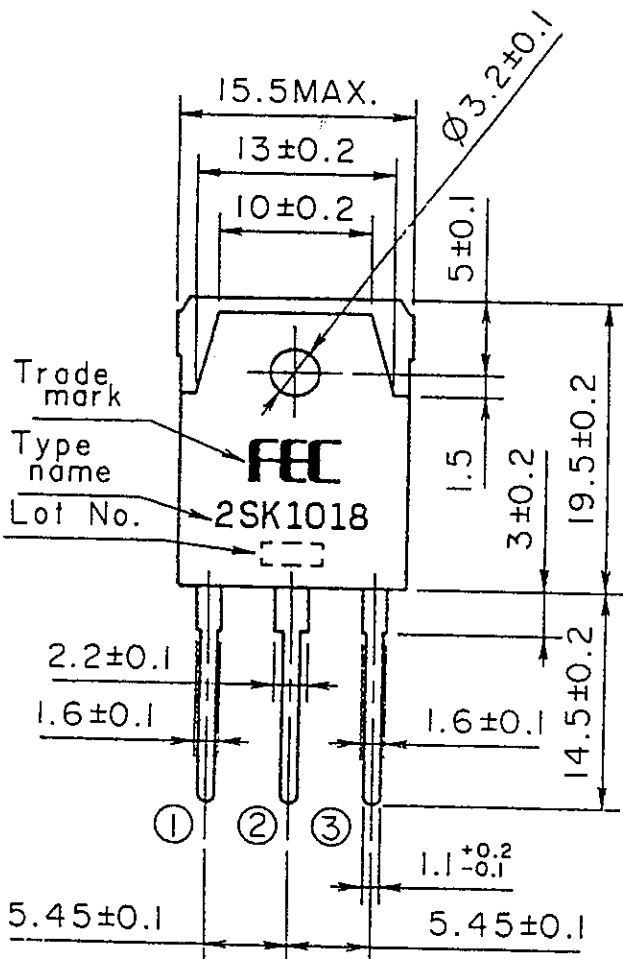
V_{SD}

Transient thermal impedance $Z_{thjc} = f(t)$
 parameter: $D = t/\tau$



FUJI POWER MOS FET

TYPE : 2SK1018



DIMENSIONS ARE IN MILLIMETERS.

CONNECTION

- ① GATE
- ② DRAIN
- ③ SOURCE

JEDEC : TO-228AA

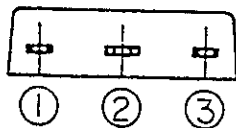
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