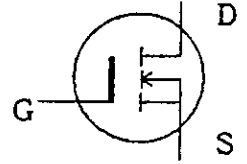


Fuji power MOSFET Specification

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	$V_{GS}$	$\pm 30$	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	$BV_{DSS}$	$I_D=1\text{mA}$ $V_{GS}=0\text{V}$	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	$I_{DSS}$	$V_{DS}=500\text{V}$ $V_{GS}=0\text{V}$	$T_{ch}=25^\circ\text{C}$		10	500	$\mu\text{A}$
	$I_{DSS}$		$T_{ch}=125^\circ\text{C}$		0.2	1.0	mA
Gate-source leakage current	$I_{GSS}$	$V_{GS}=\pm 30\text{V}$ $V_{DS}=0\text{V}$		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	$\Omega$	

	DATE	NAME	APPROVED
DRAWN	Aug.-20-'90	T. SHIOYAMA	
CHECKED	Aug.-21-'90	T. Arai	
REVISIONS	Aug. 21-'90	S. Furukata	

Fuji Electric Co.,Ltd.	
DWG. NO.	MT5F1764
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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		$\mu C$

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	$^\circ C/W$

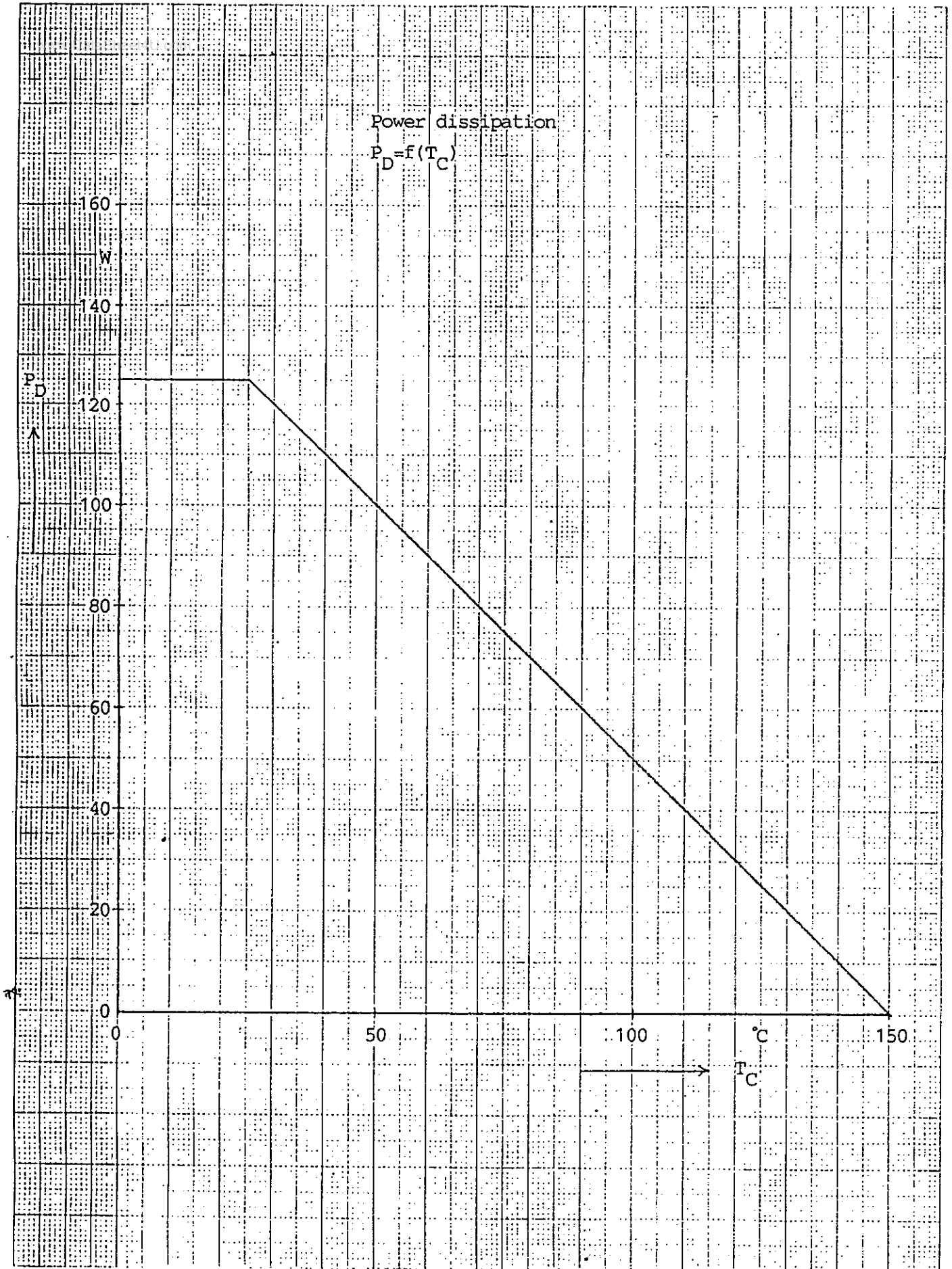
DATE	NAME	APPROVED	Fuji Electric Co.,Ltd.	
DRAWN	-		DWG.NO.	MT5F1764
CHECKED	-			
REVISIONS				

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Power dissipation

$$P_D = f(T_C)$$

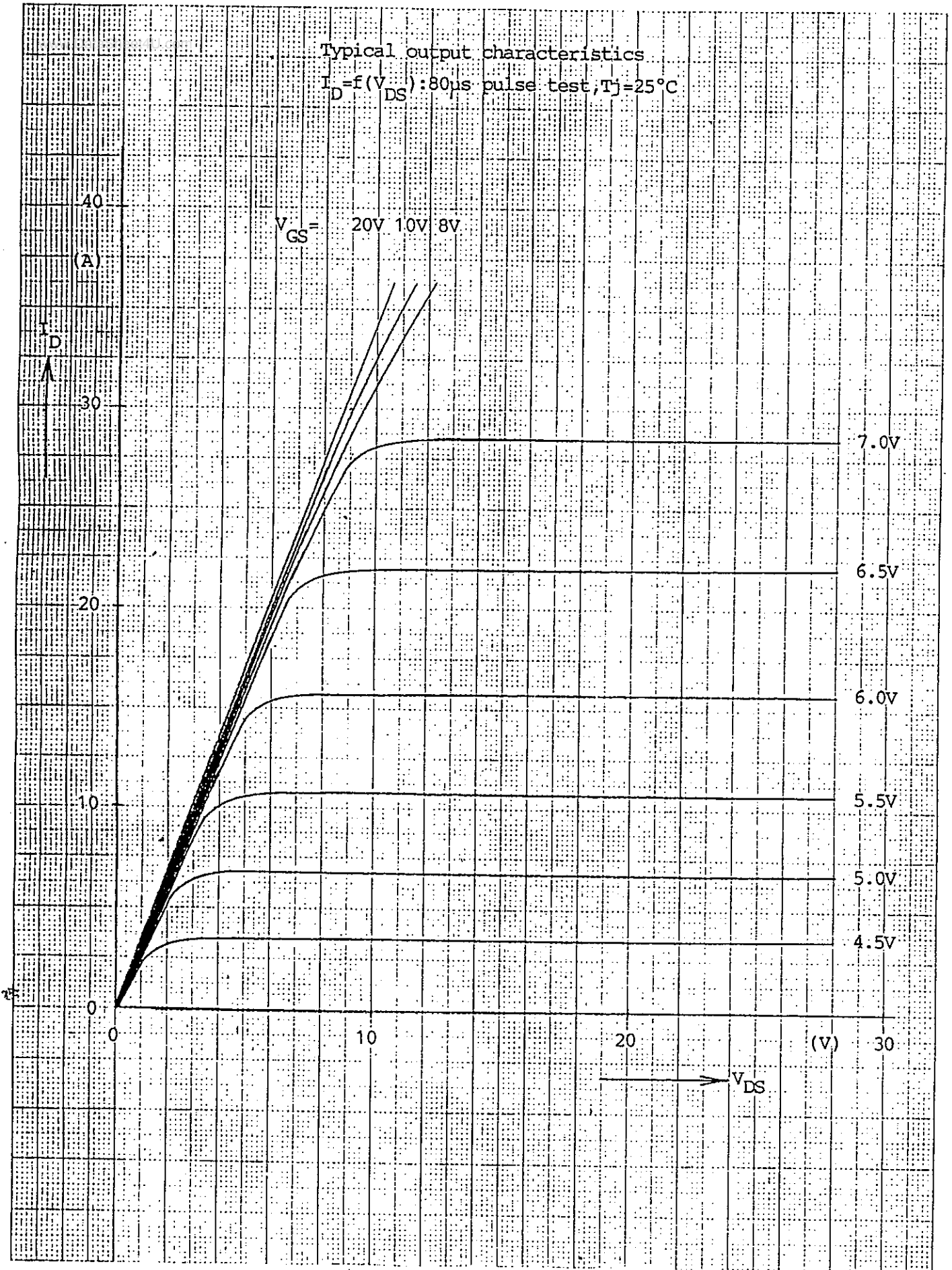


JIS A4 180 × 250mm



Typical output characteristics

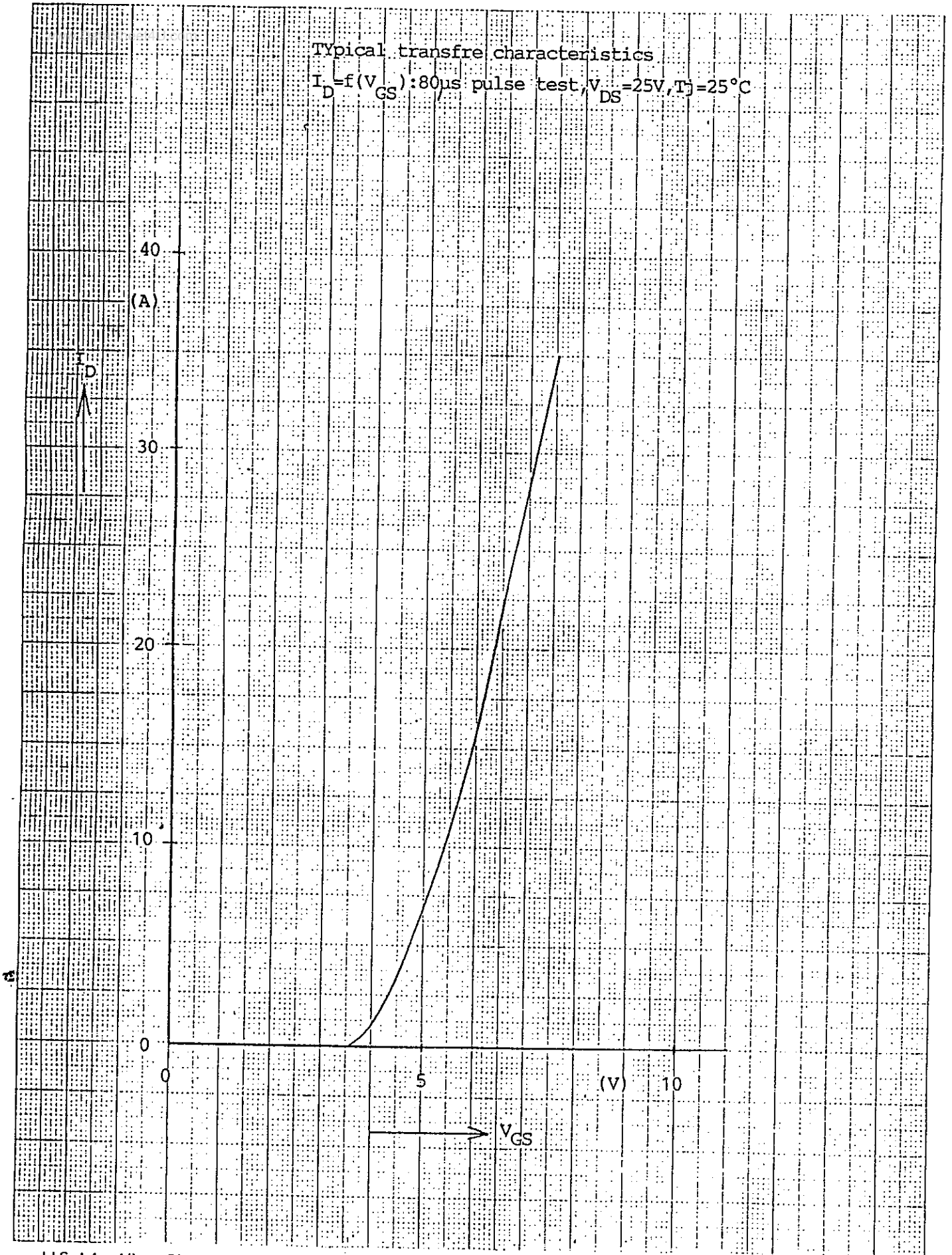
$I_D = f(V_{DS})$ : 80 $\mu$ s pulse test,  $T_j = 25^\circ\text{C}$



JIS A4 120 × 250mm

Typical transfer characteristics

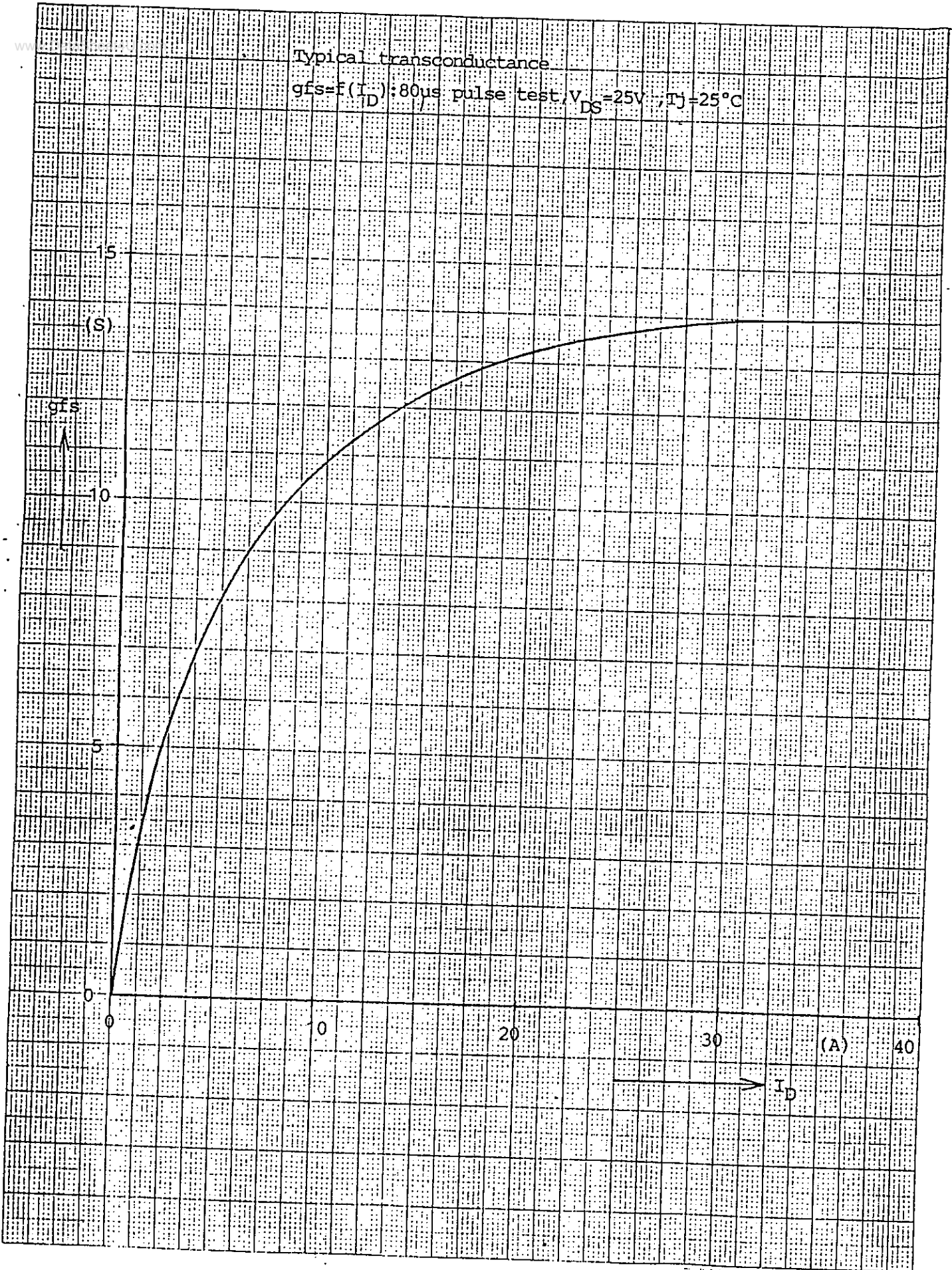
$I_D = f(V_{GS})$ : 80 $\mu$ s pulse test,  $V_{DS} = 25V$ ,  $T_j = 25^\circ C$



JIS A4 180 250mm

Typical transconductance

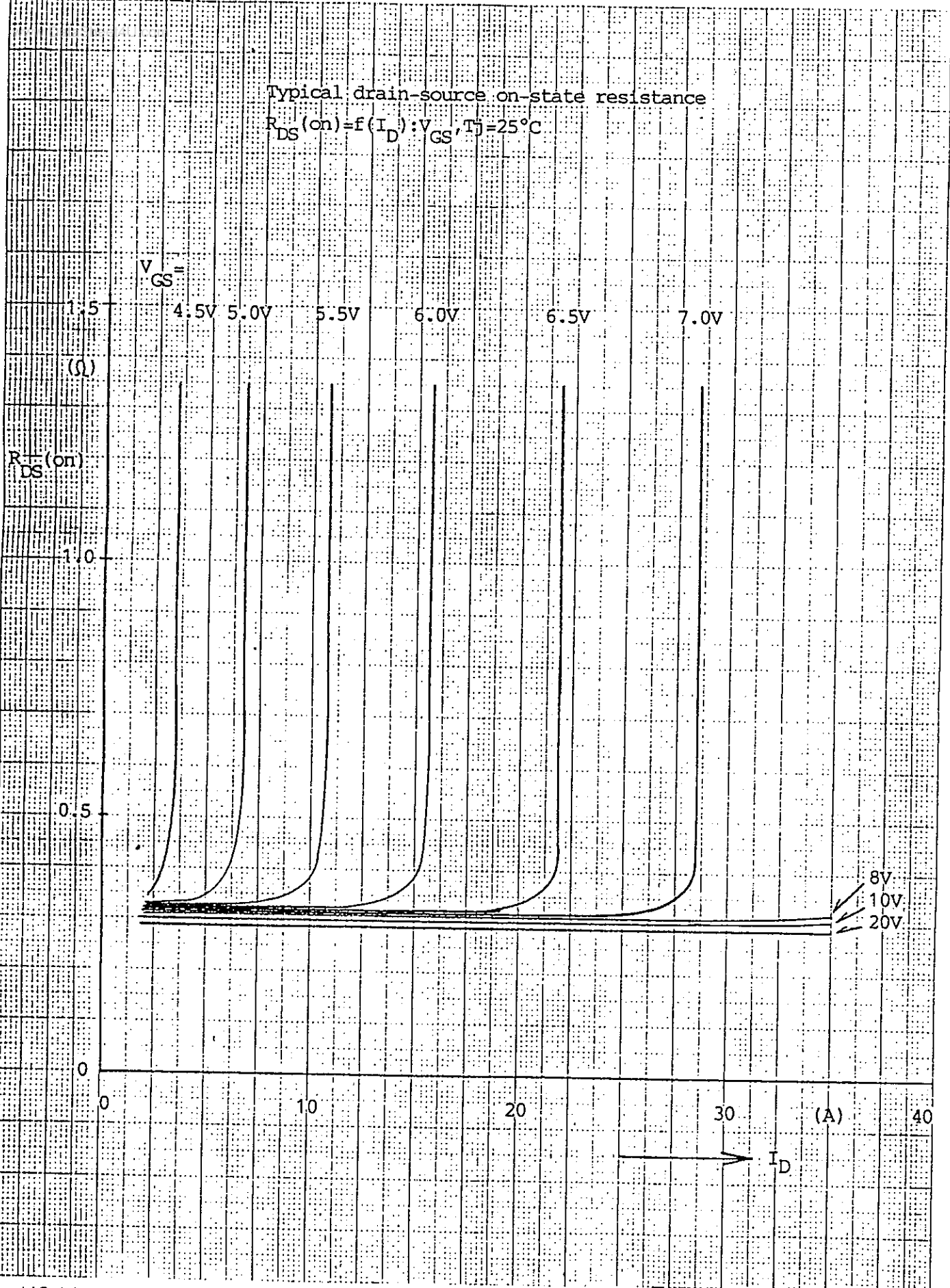
$g_{fs} = f(I_D)$ : 80 $\mu$ s pulse test,  $V_{DS} = 25V$ ,  $T_J = 25^\circ C$





Typical drain-source on-state resistance

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



JIS A4 180 x 250mm

Drain-source on-state resistance

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

1.5  
( $\Omega$ )

$R_{DS(on)}$



1.0

0.5

0

-50

0

50

100

( $^{\circ}C$ )

150

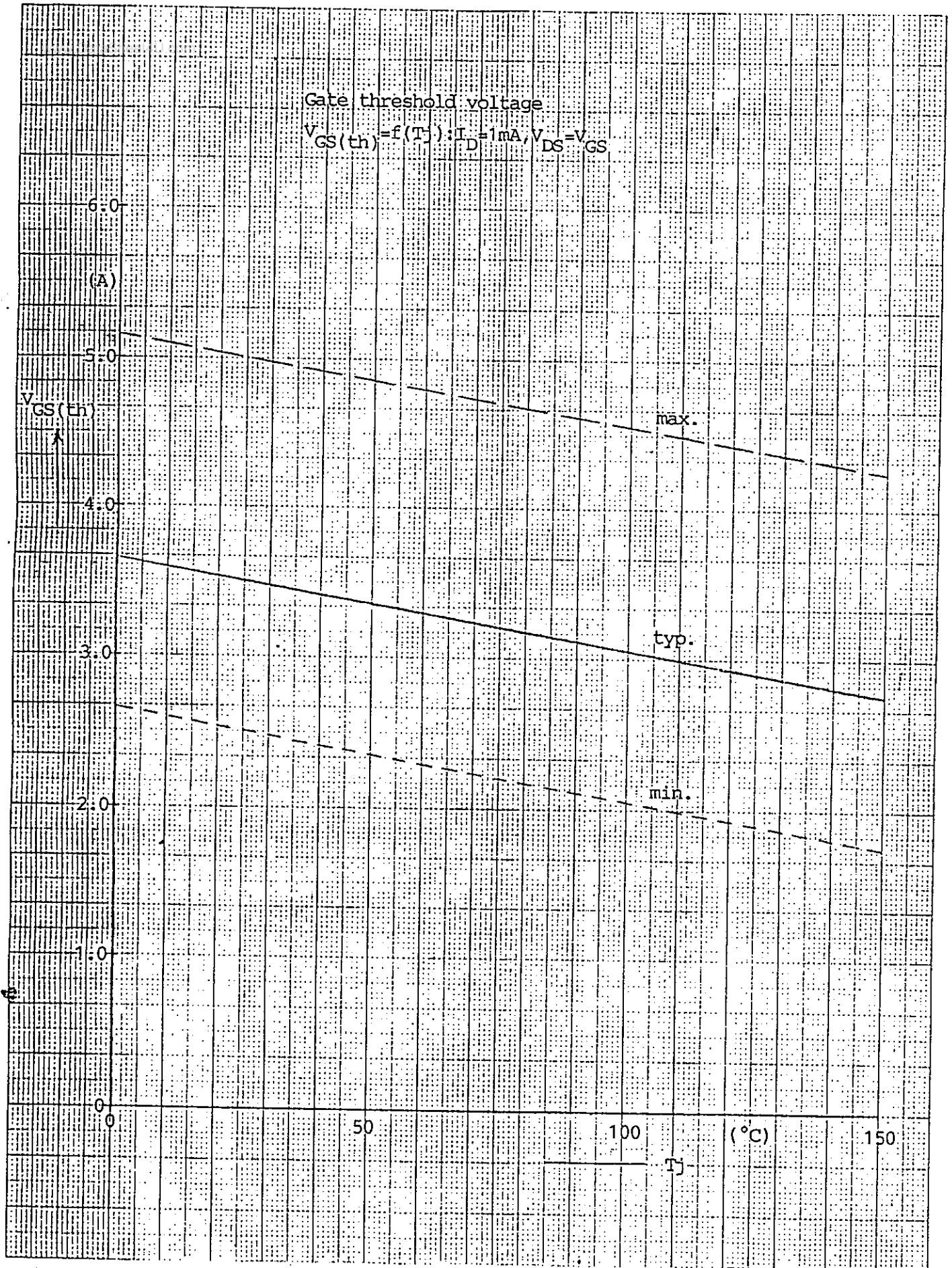
Max.

Typ.

$T_j$

Gate threshold voltage

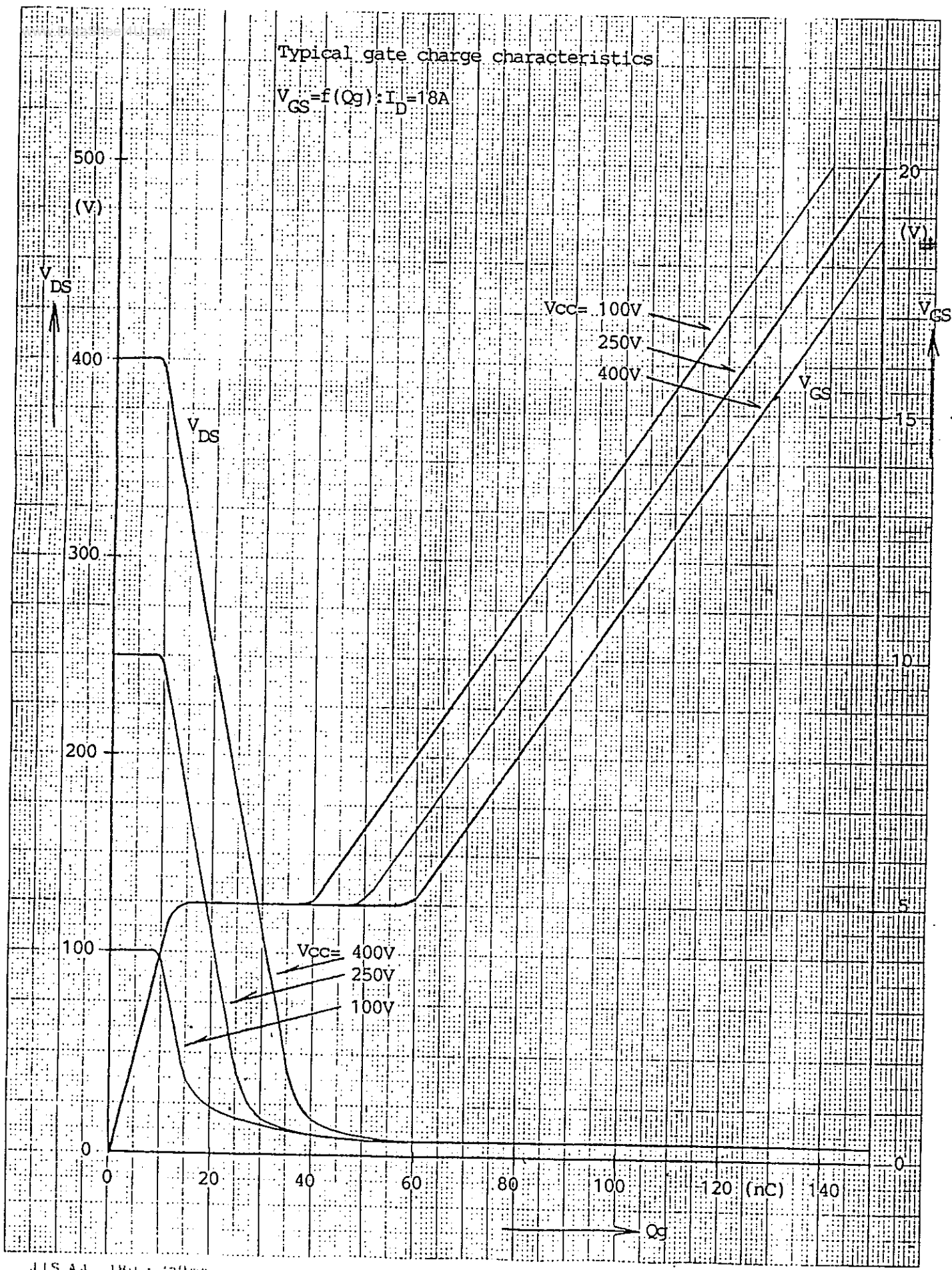
$$V_{GS(th)} = f(T_J); I_D = 1\text{mA}, V_{DS} = V_{GS}$$



JIS A4 180 x 250mm

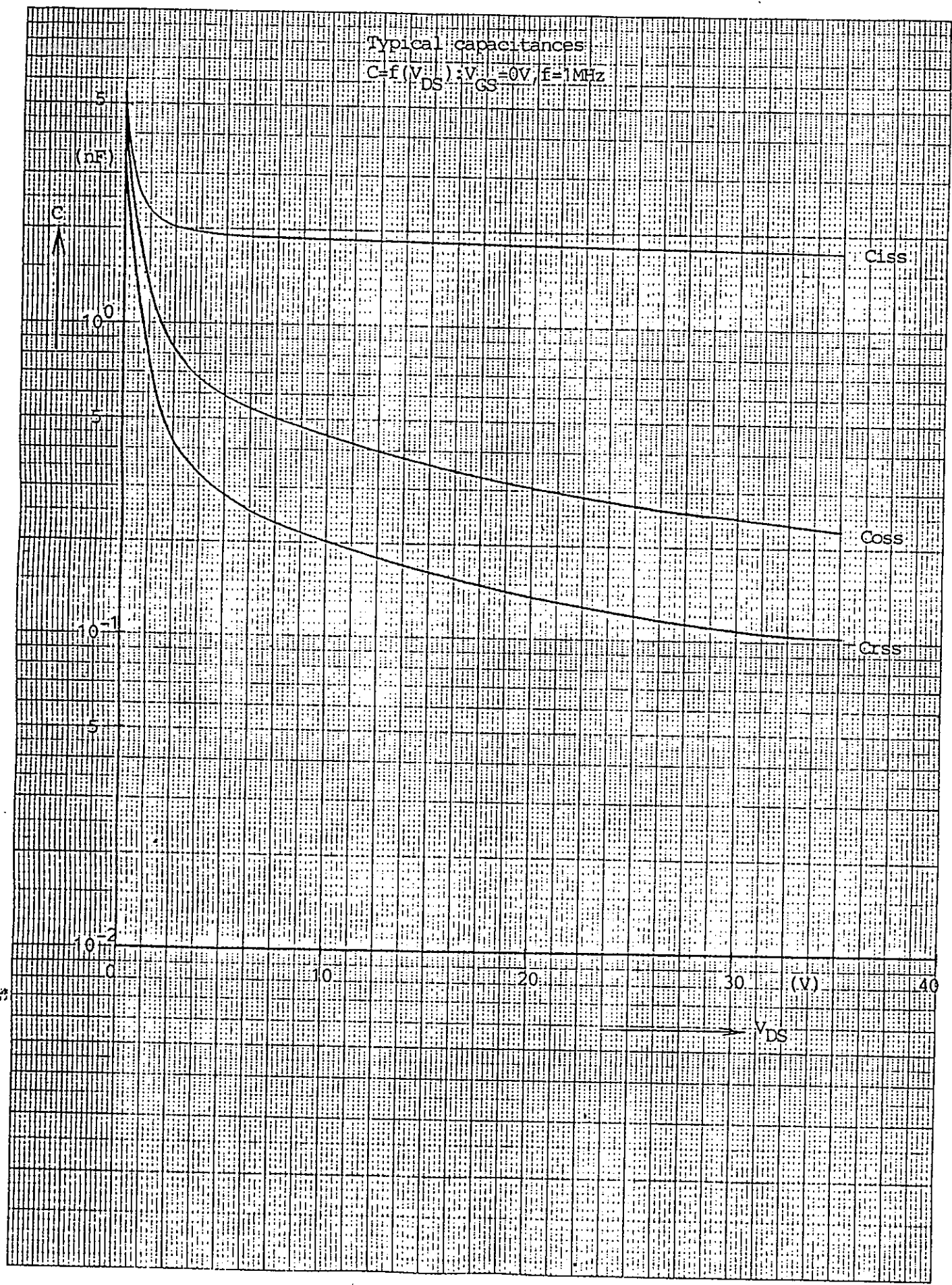
Typical gate charge characteristics

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

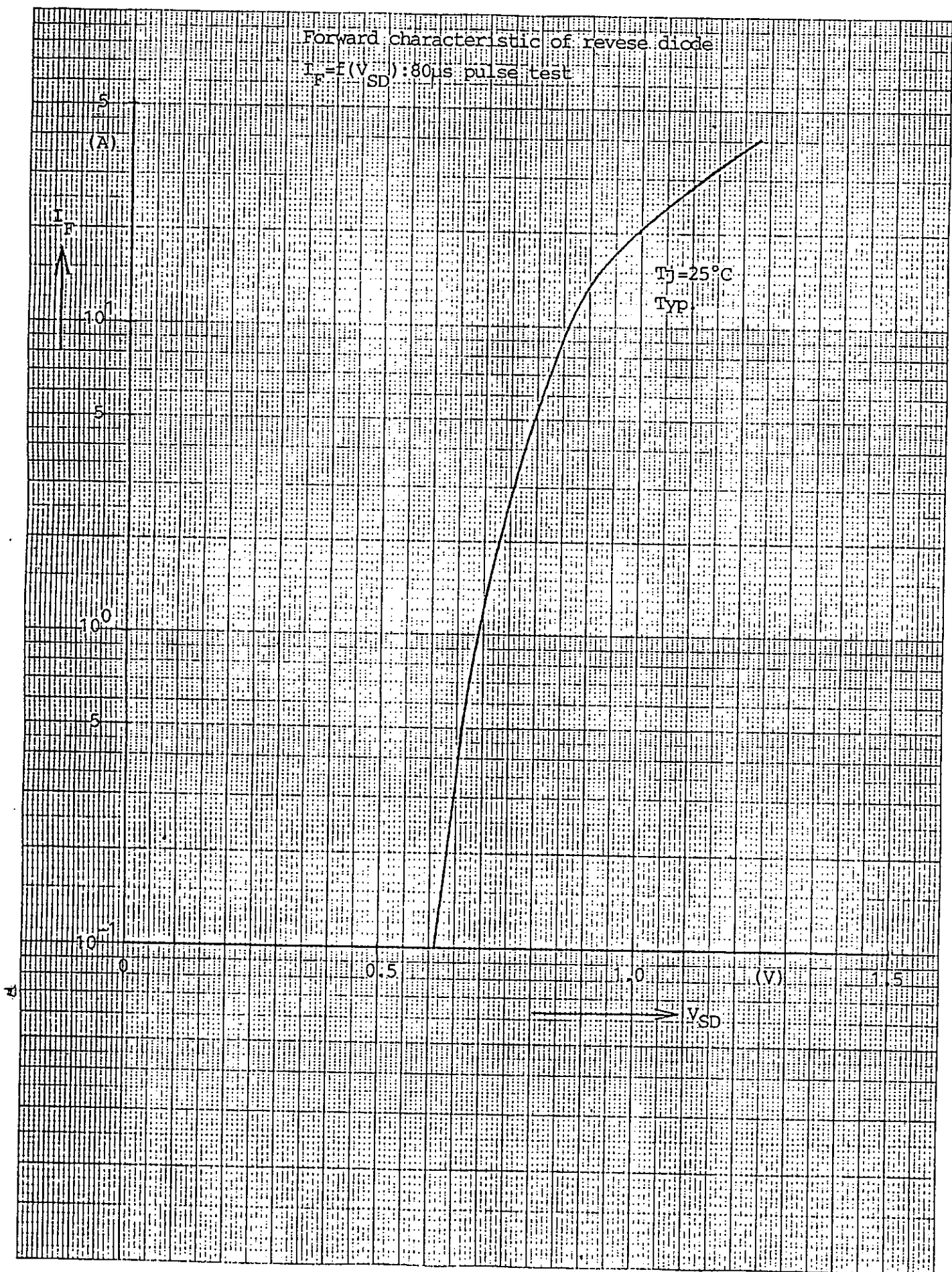


JIS A4 180 - 250mm

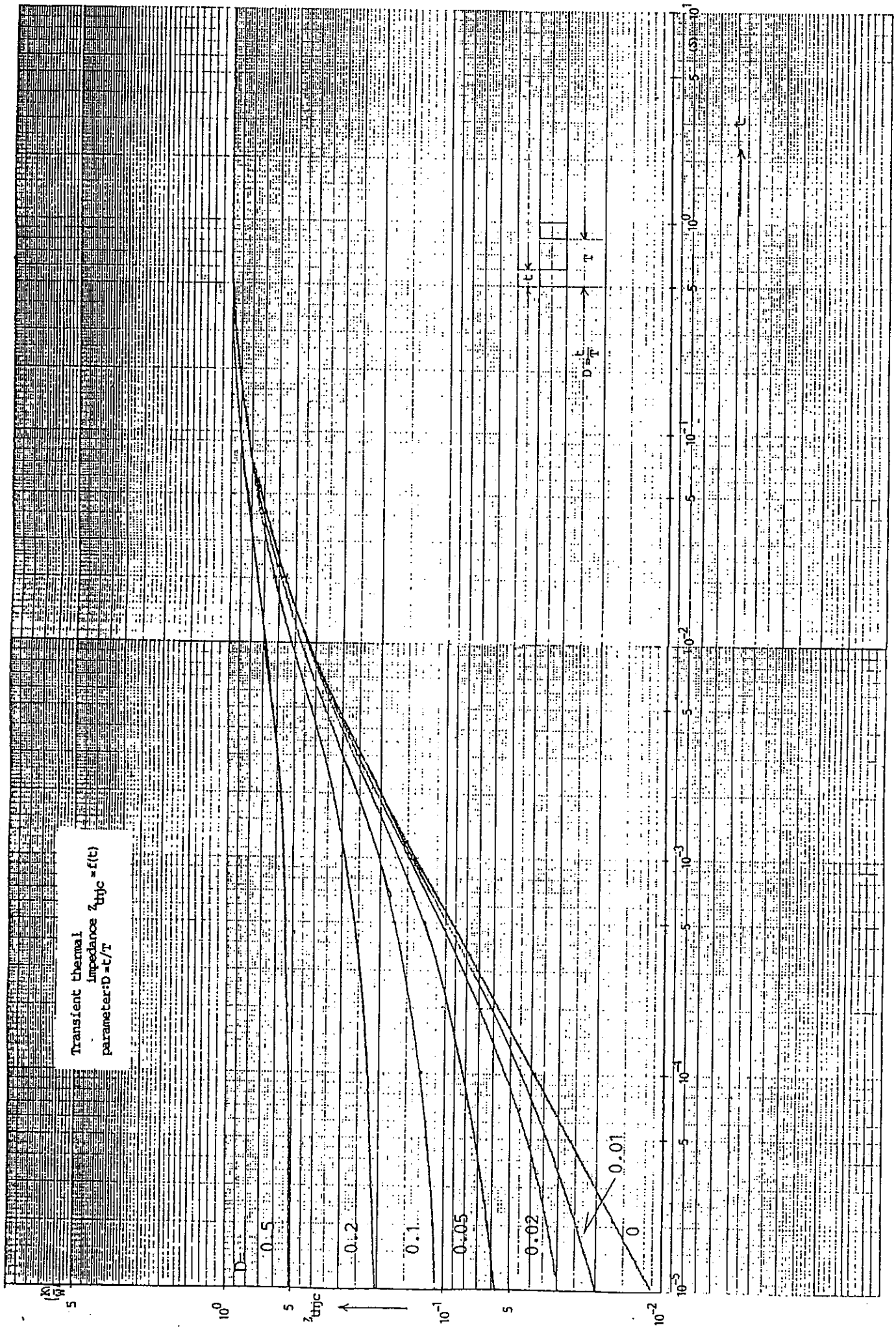
Typical capacitances  
 $C=f(V_{DS}): V_{GS}=0V, f=1MHz$



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



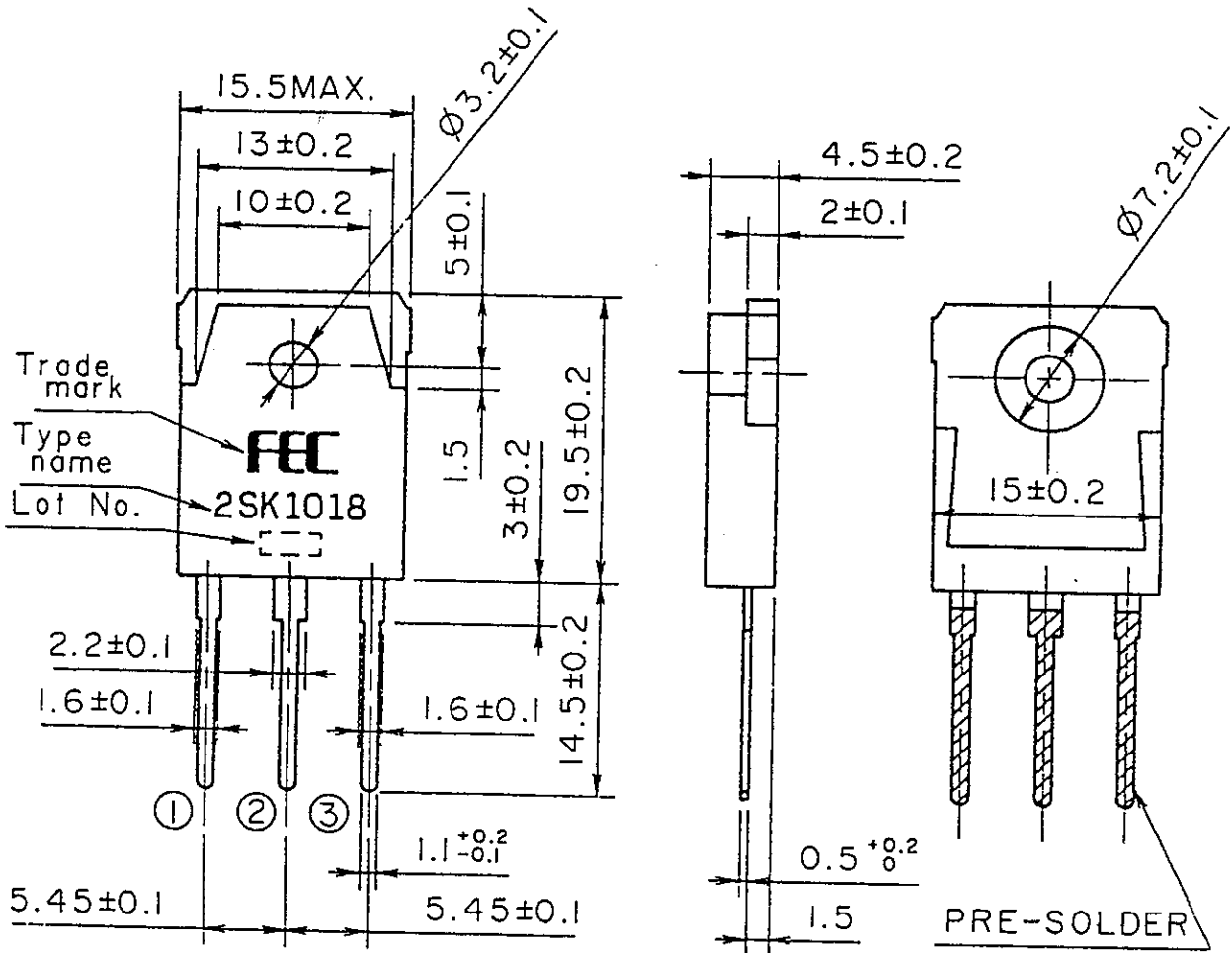
Transient thermal  
Impedance  $Z_{thjc} = f(t)$   
parameter:  $D = c/T$



# FUJI POWER MOS FET

TYPE : 2SK1018

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DIMENSIONS ARE IN MILLIMETERS.

## CONNECTION

- ① GATE
- ② DRAIN
- ③ SOURCE

JEDEC : TO-228AA

EIAJ : SC-65

MS.T03P.2SK1018-E

Fuji Electric Co., Ltd.

MK5C24562

	DATE	NAME	APPROVED
DRAWN	1990-02-16	MARUYAMA	
CHECKED	1990-02-16	ARA I	

REVISIONS

DWG. NO.

MA3LE

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