

Fuji power MOSFET Specification

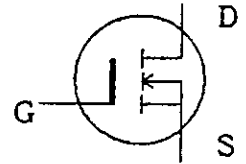
2SK1018

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} T_{stg}	150 -55 ~ +150	$^\circ\text{C}$ $^\circ\text{C}$	

4. Electrical characteristics at $T_c=25^\circ\text{C}$ (unless otherwise specified)

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	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	Ω

DATE	NAME	APPROVED	Fuji Electric Co., Ltd.
DRAWN Aug. -20-'90 T. SHIOYAMA			
CHECKED Aug. -21-'90 T. Arai			
Aug. -21-'90 S. Furukata			
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 drain 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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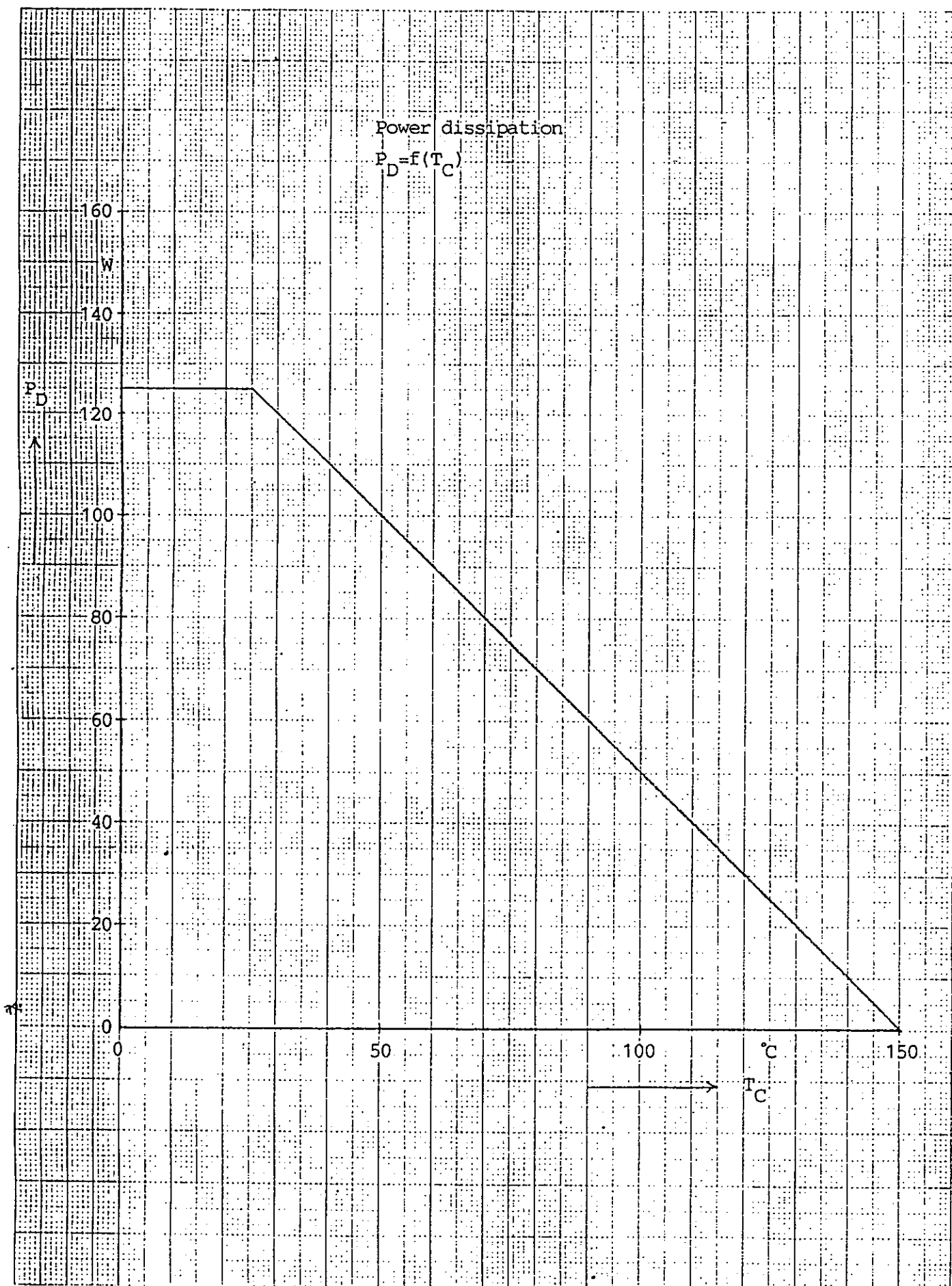
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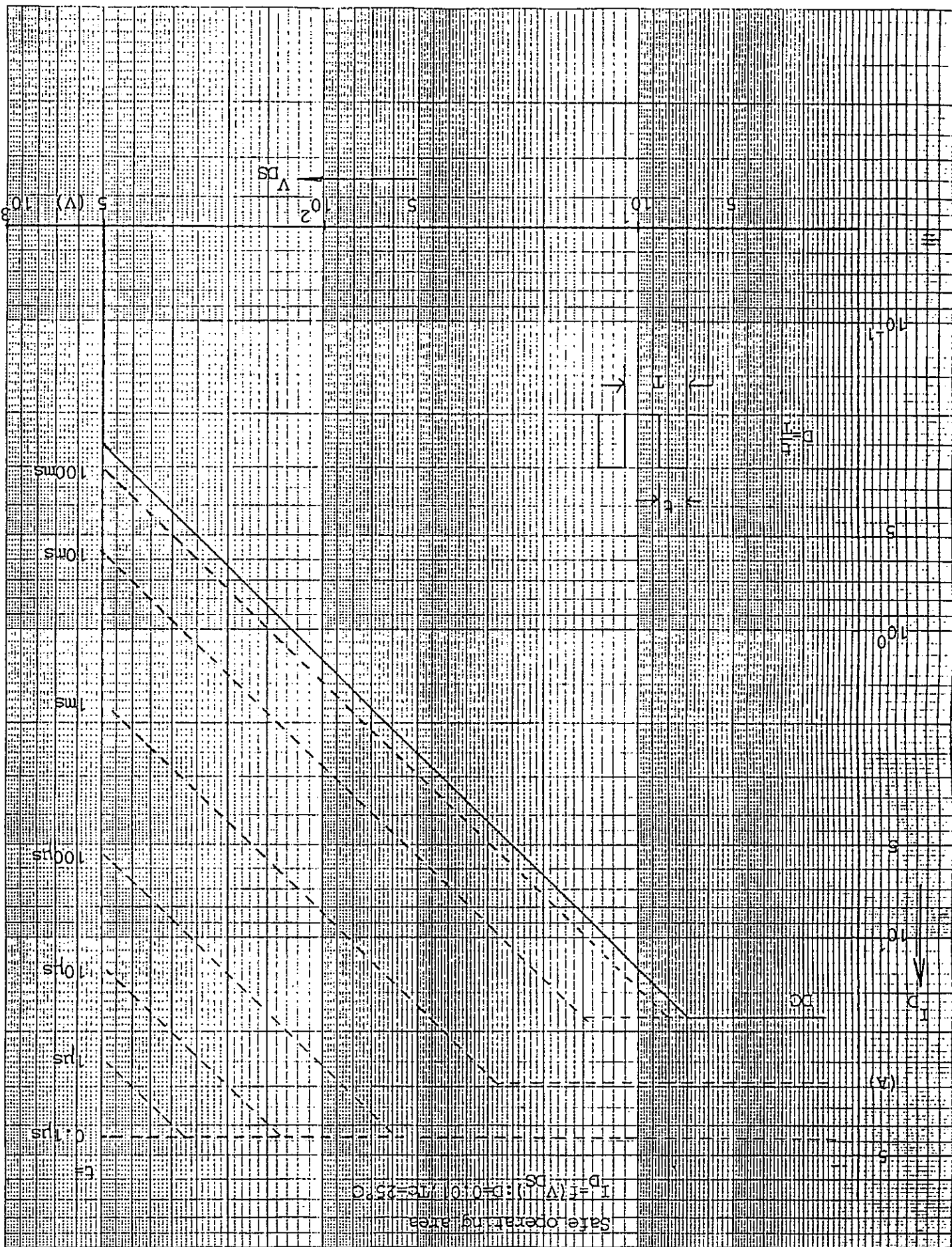
JIS A4 180 x 250 mm

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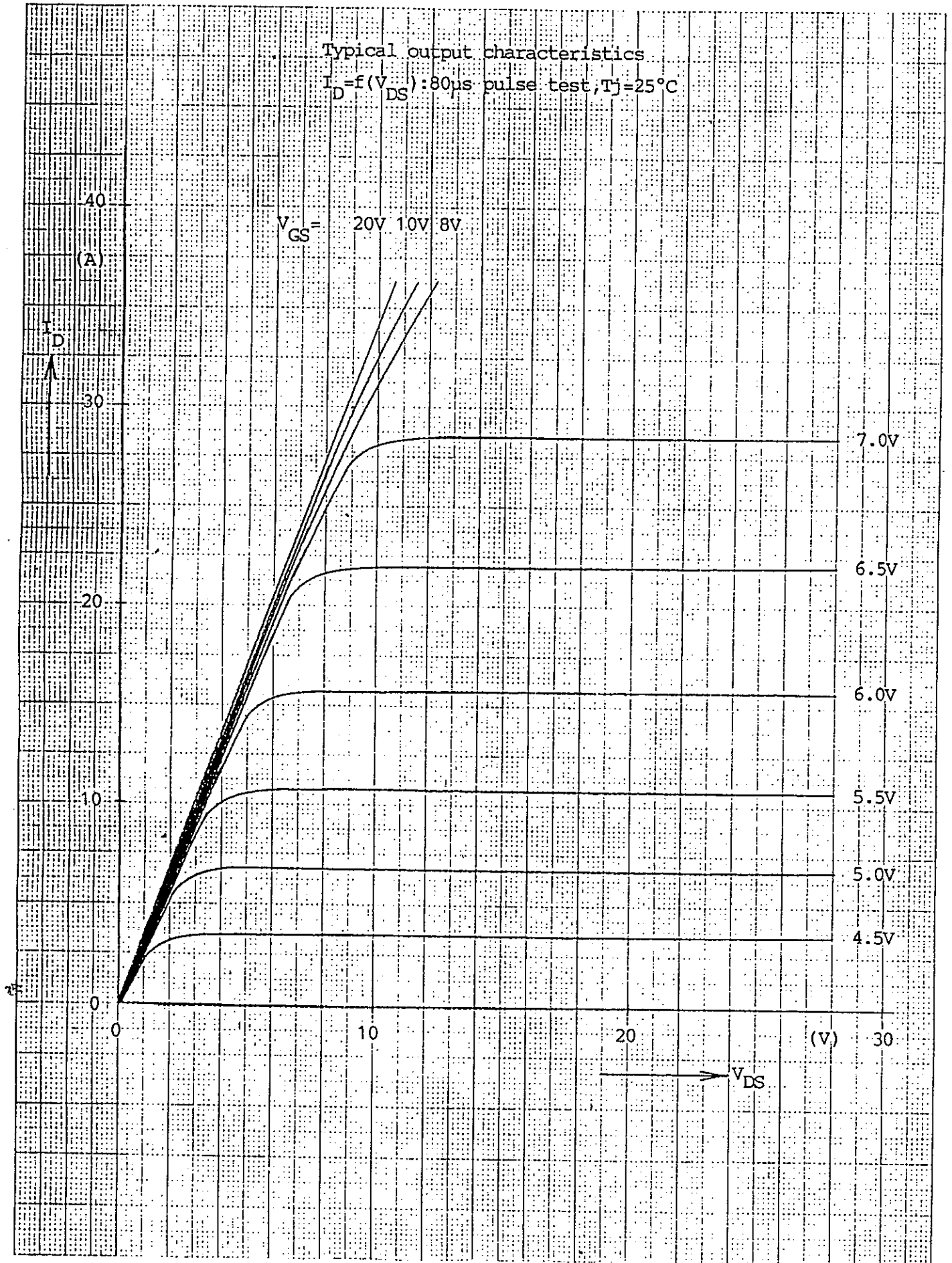
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Typical output characteristics

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



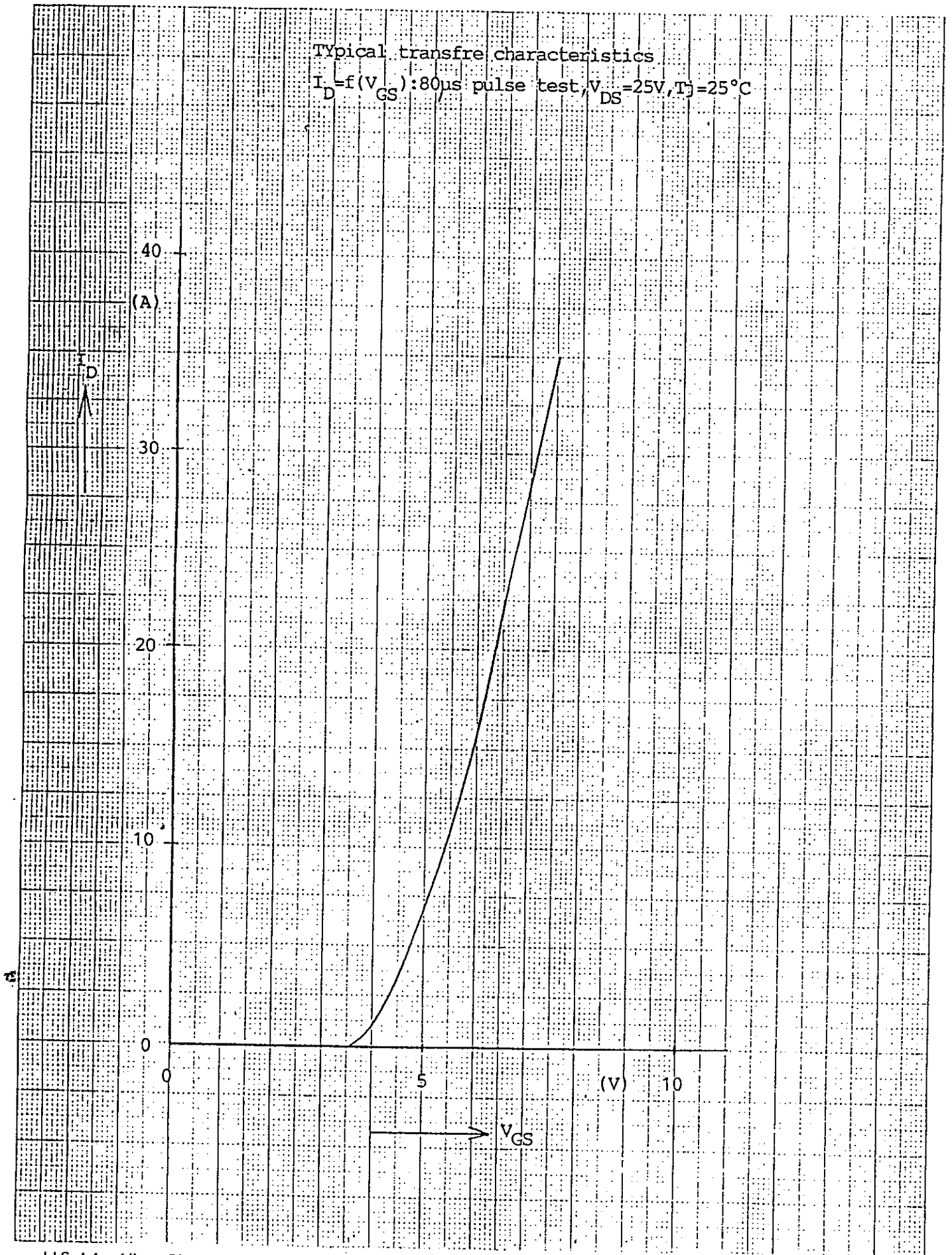
JIS A4 120 × 250mm

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Typical transference characteristics

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



JIS A4 180 250mm

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Typical transconductance

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

15
(S)

g_{fs}

10

5

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

20

30

(A)

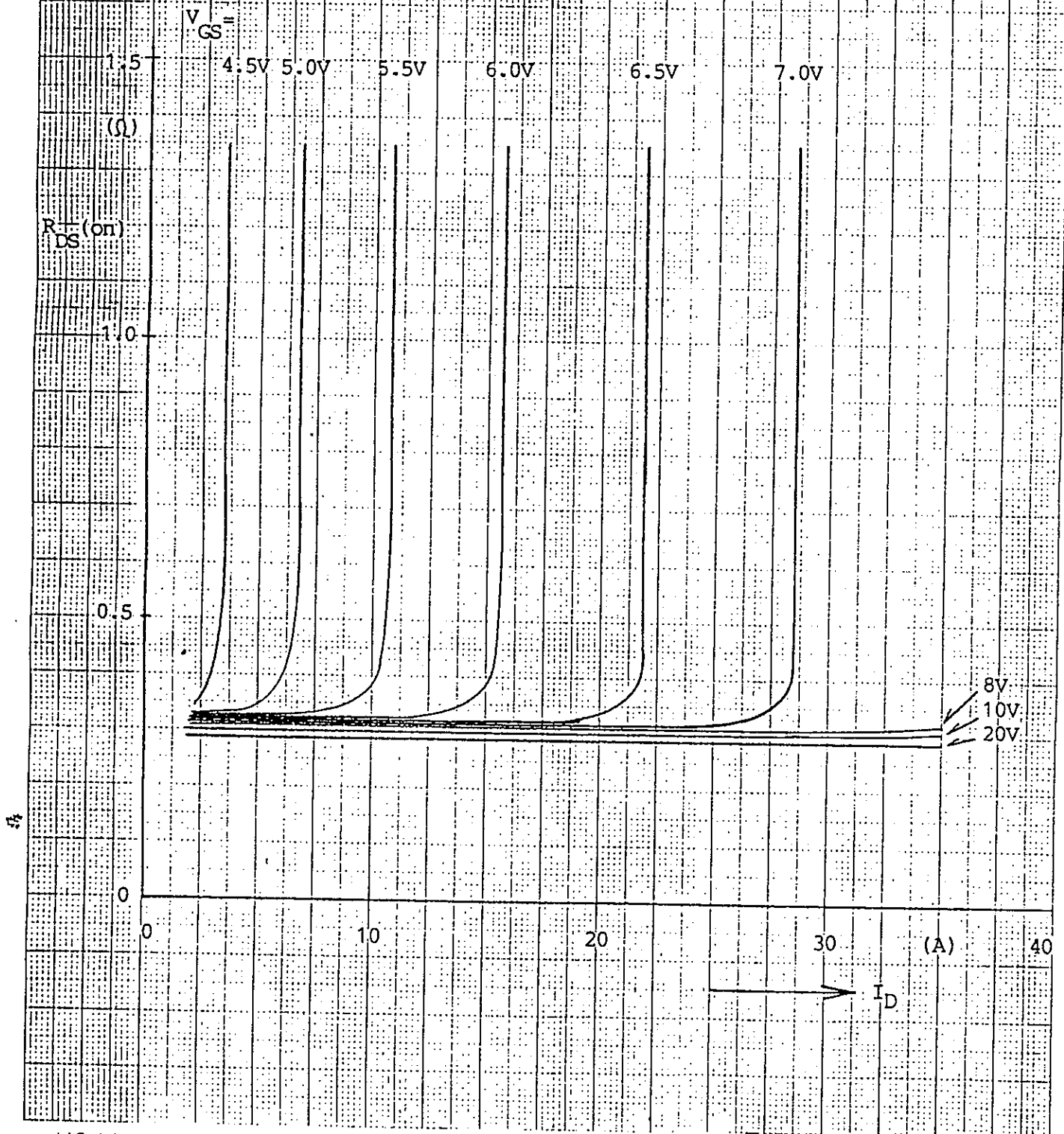
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I_D

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Typical drain-source on-state resistance

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

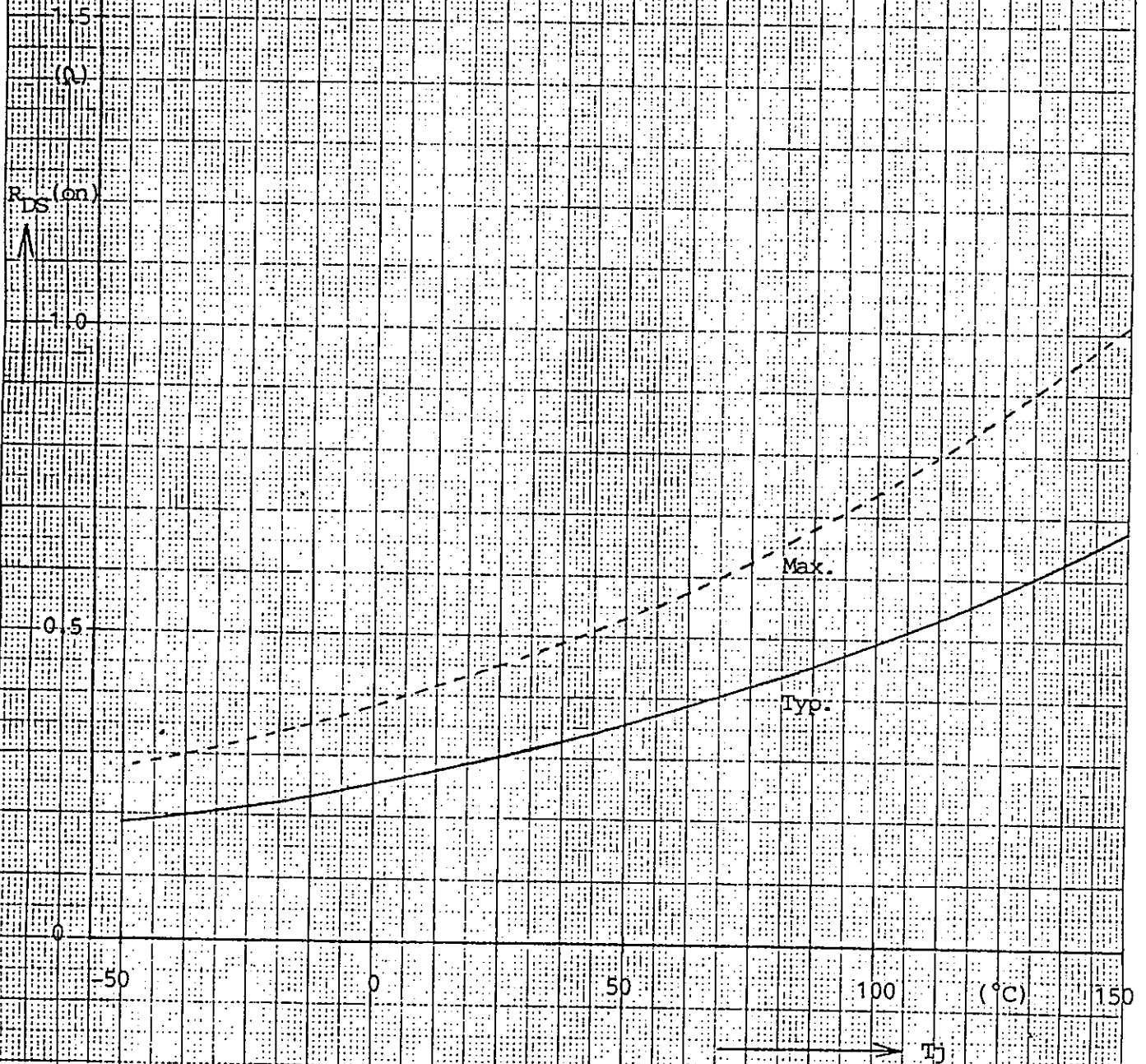


JIS A4 180 × 250mm

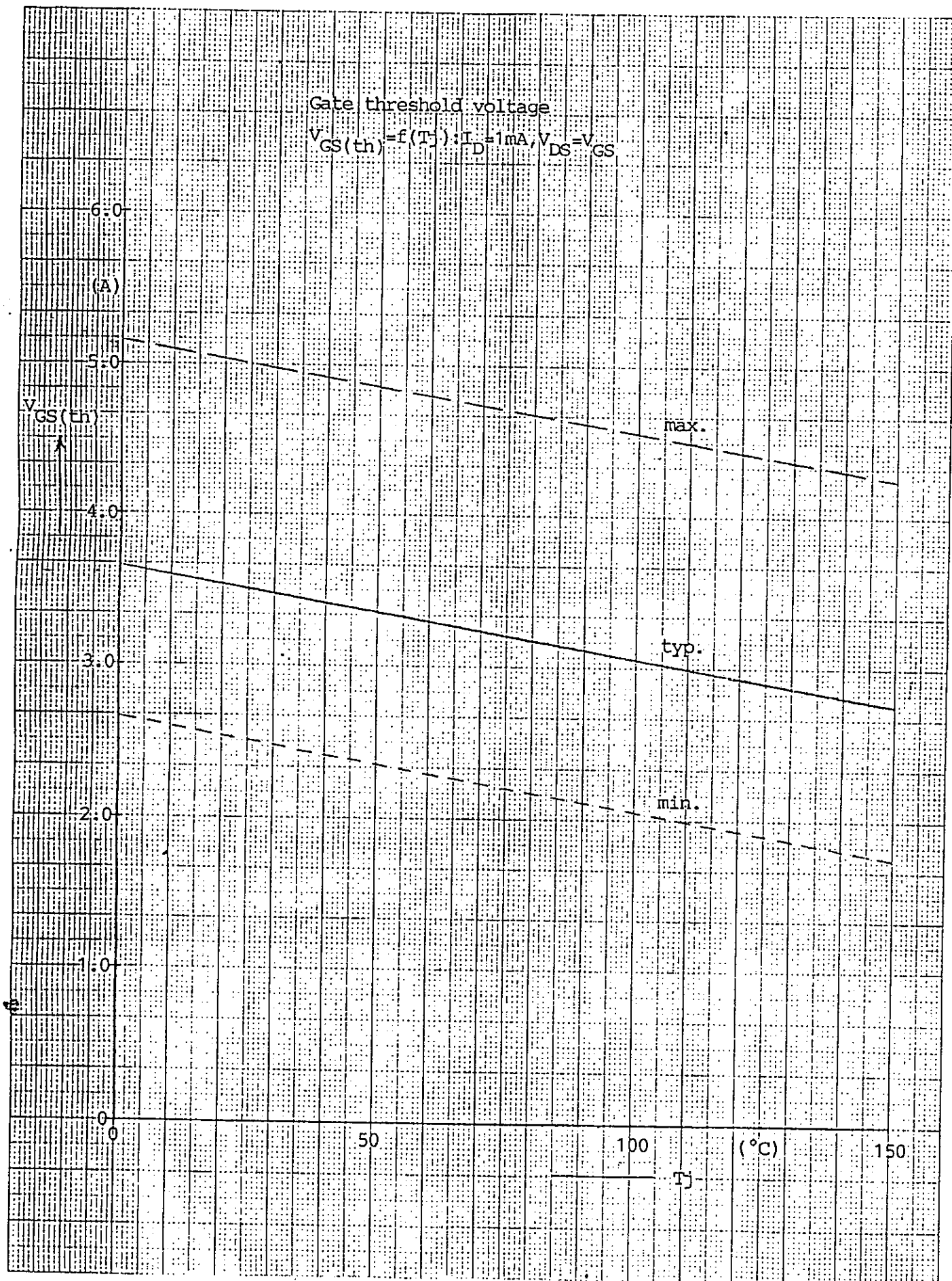
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Drain-source on-state resistance

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



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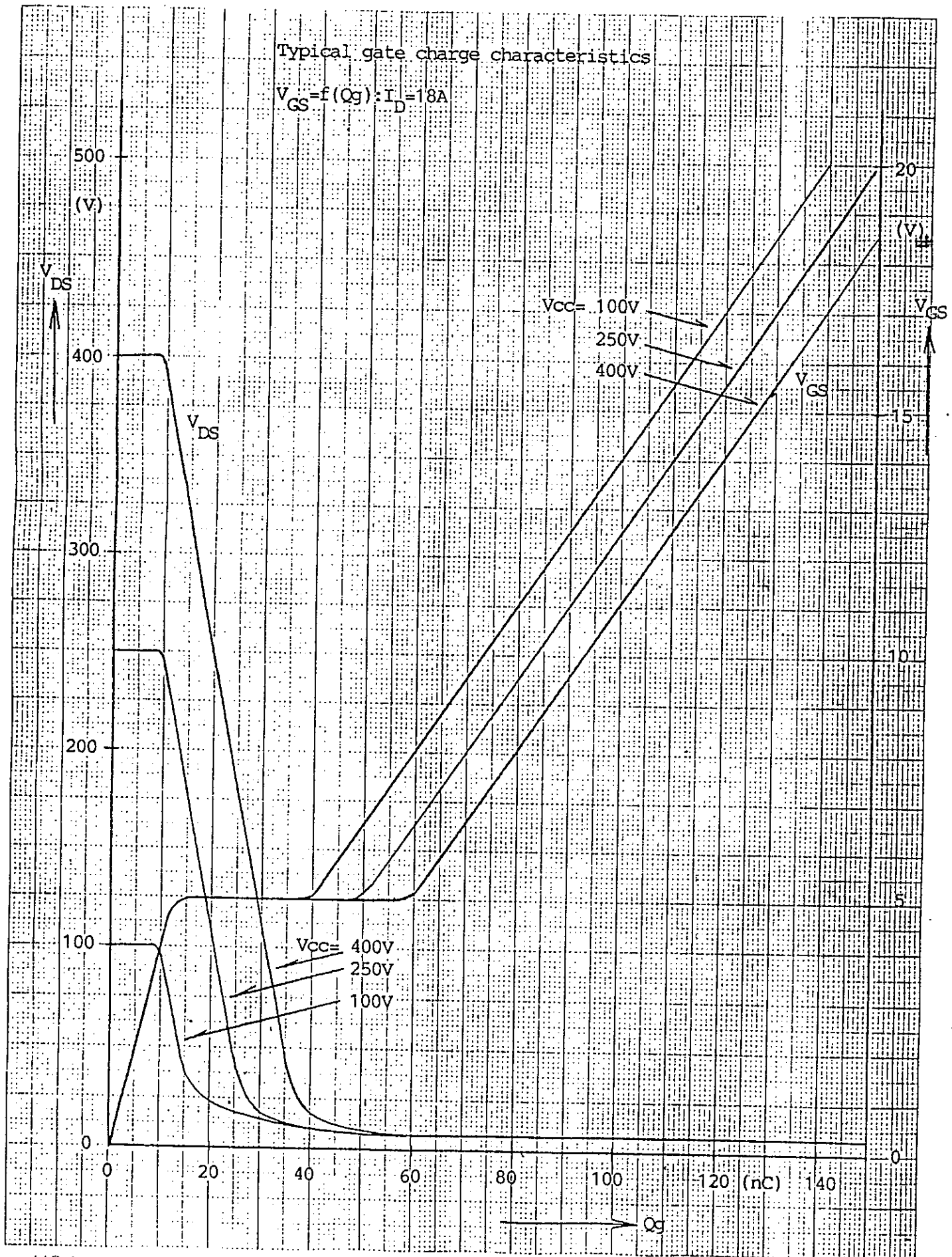


JIS A4 180 × 250mm

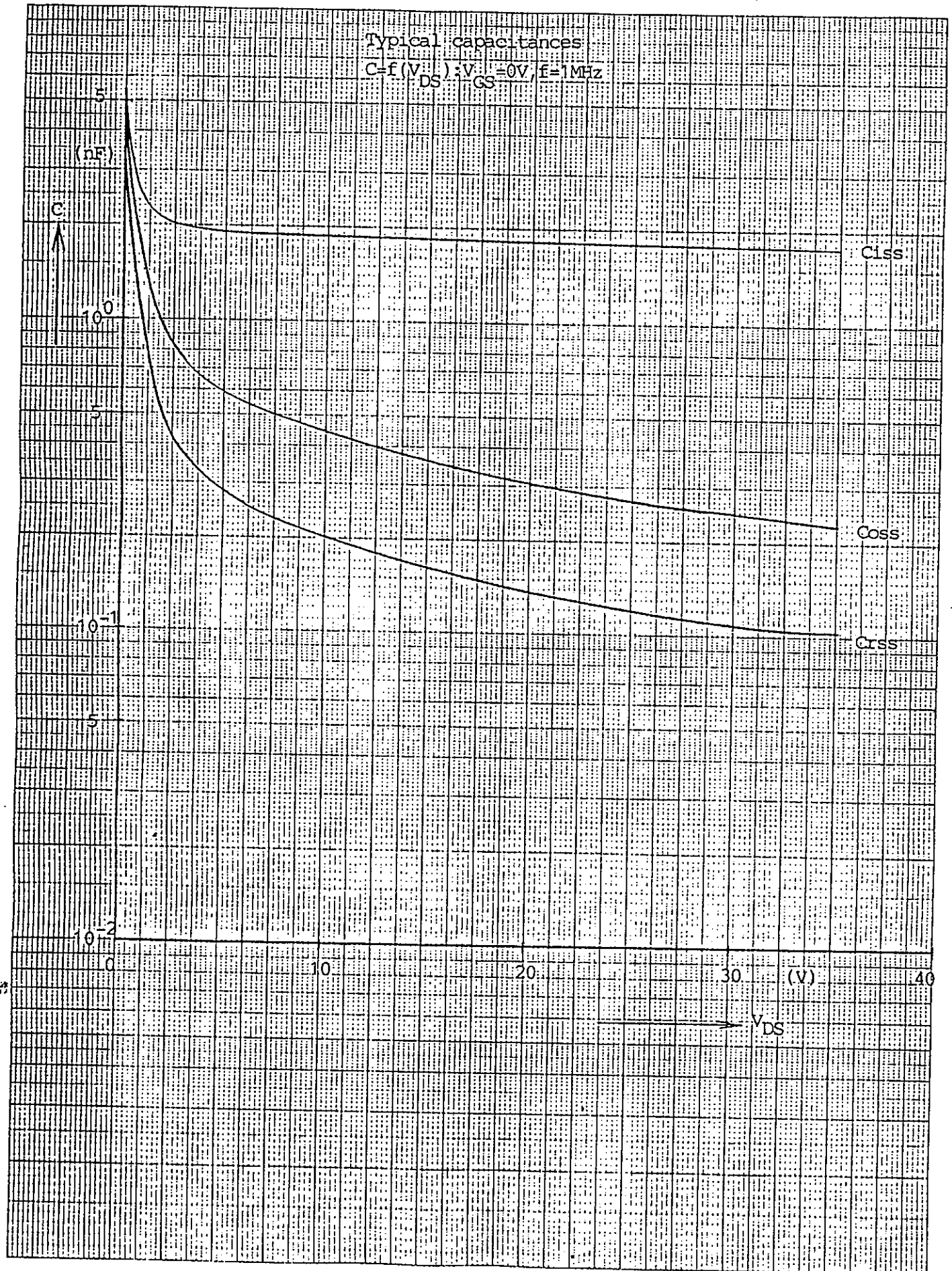
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Typical gate charge characteristics

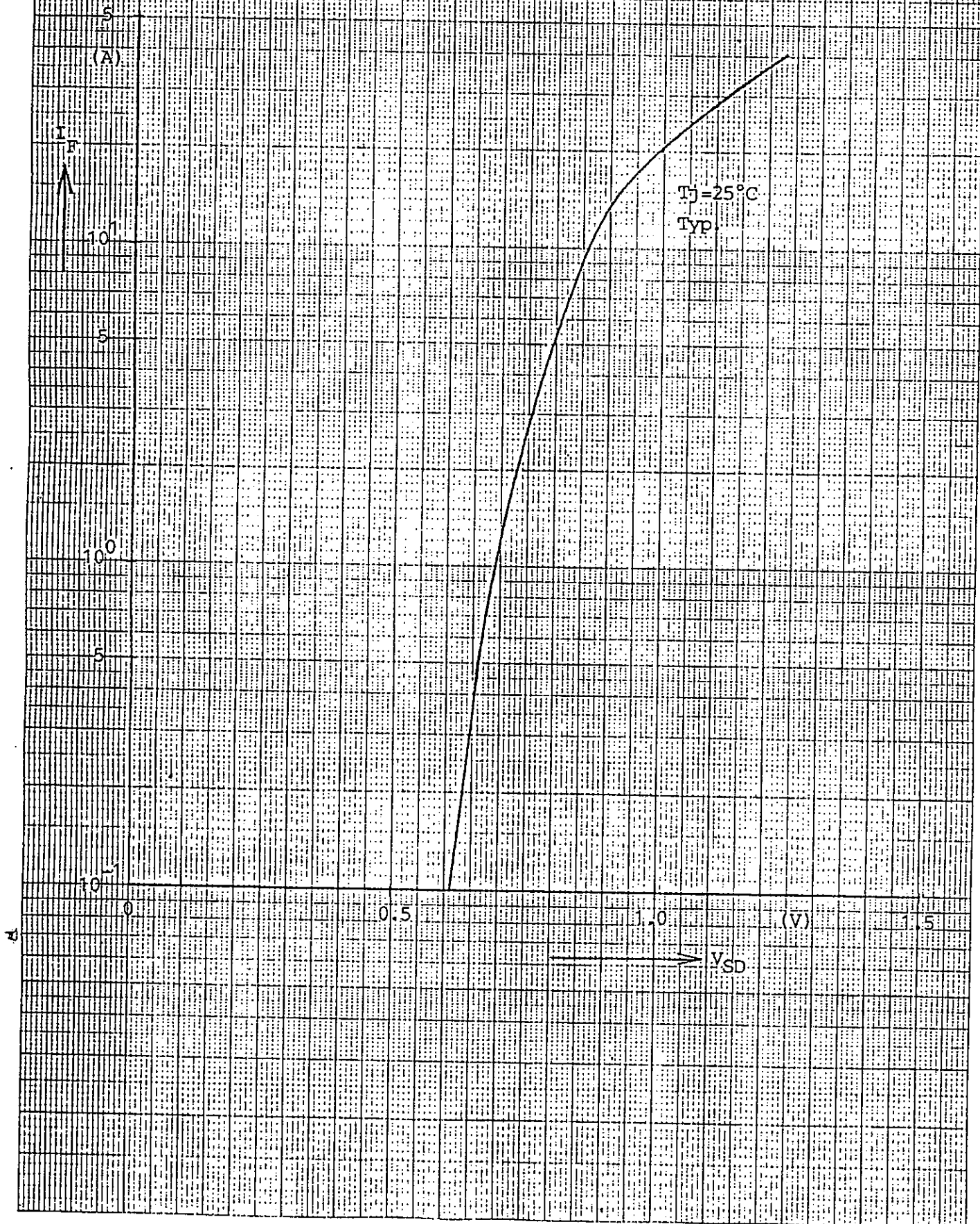
$$V_{GS} = f(Q_g) : I_D = 18A$$



JIS A4 180 × 250mm

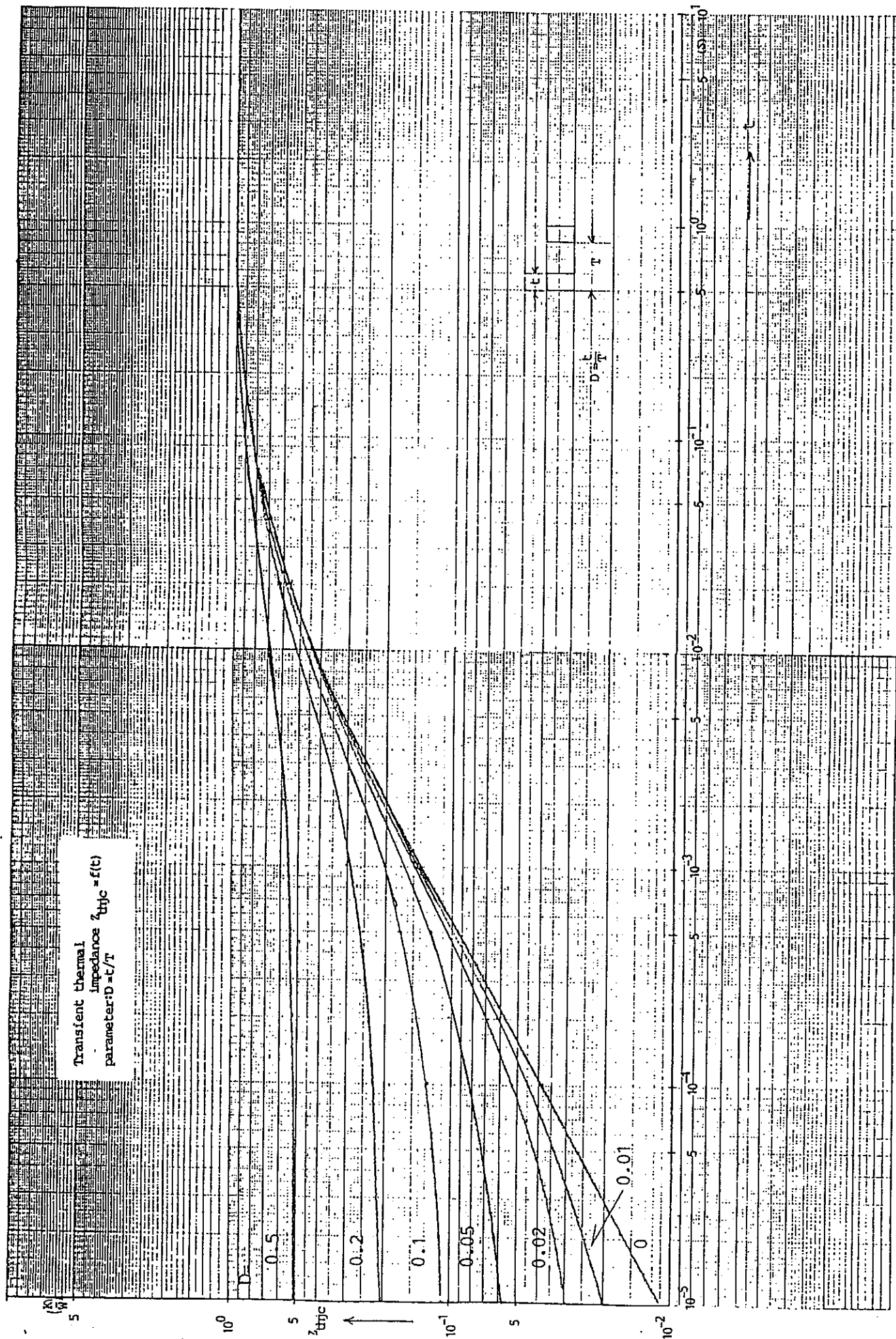


Forward characteristic of reverse diode
 $I_F = f(V_{SD})$: 80 μ s pulse test



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

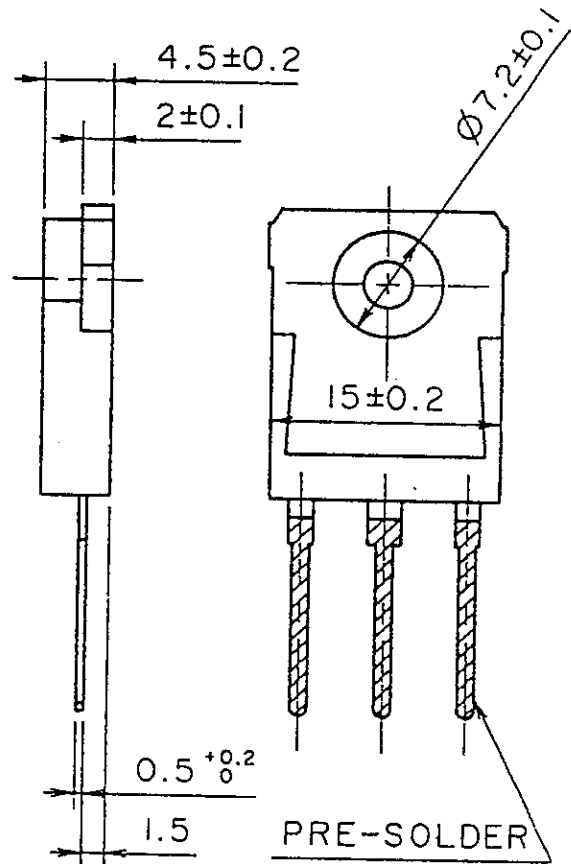
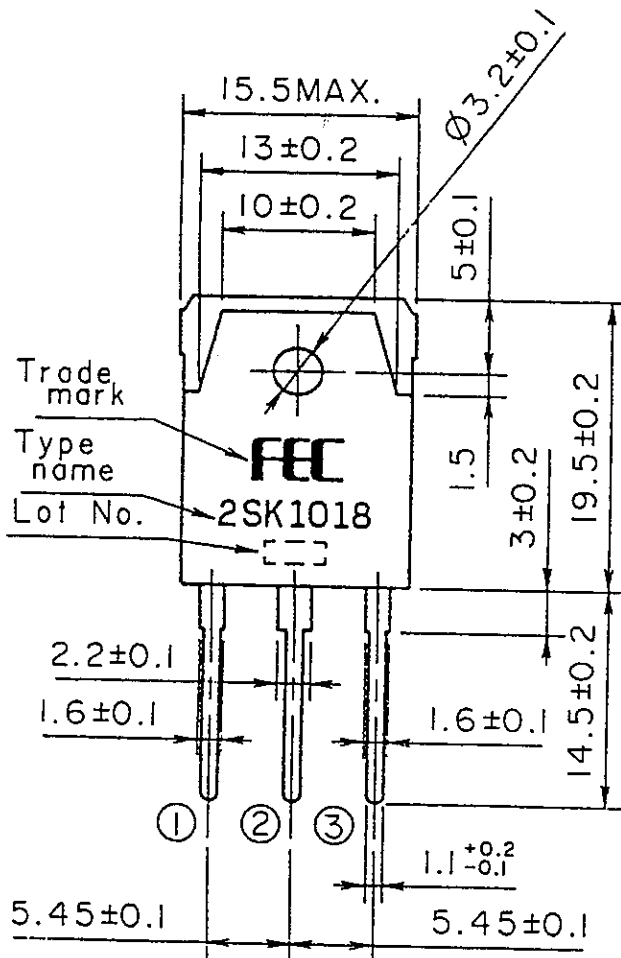


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FUJI POWER MOS FET

TYPE : 2SK1018



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
1990-02-16	MARUYAMA	
1990-02-16	ARA I	

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