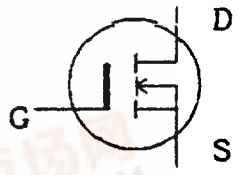
COLLMER SEMICONDUCTOR INC

2SK1512 T-39-13

48E D ■ 2238792 0001822 952 ■COL

1. Scope
This specifies Fuji power MOSFET 2SK1512

2. Outline
Ⅰ) Construction N-channel enhancement mode power MOSFET
Ⅱ) Application for switching
Ⅲ) Outview TO-3P (MK5C25623)



3. Absolute maximum ratings at Tc=25 ℃ (unless otherwise specified)

Description	Symbol	Characteristics	Unit	Remarks
Drain-source voltage	V_{DS}	900	V	
Drain-gate voltage	V_{DGR}	900	V	R_{GS}=20KΩ
Continuous Drain current	I_D	10	A	
Pulsed drain current	I_{Dpulse}	30	A	
Gate-source voltage	V_{GS}	± 30	V	
Maximum power dissipation	P_D	150	W	
Operating and storage temperature range	T_{ch}	150	℃	
	T_{stg}	-55 ～ +150	℃	

4. Electrical characteristics at Tc=25℃ (unless otherwise specified)
Static ratings

Description	Symbol	Conditions		Characteristics Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	BV_{DSS}	I_D=1 mA, V_{GS}=0 V		900			V
Gate threshold voltage	$V_{GS(th)}$	I_D=1 mA, V_{DS}=V_{GS}		2.5	3.5	5.0	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=900V, V_{GS}=0 V	T_{ch}= 25℃		10	500	μA
	I_{DSS}		T_{ch}=125℃		0.2	1.0	mA
Gate-source leakage current	I_{GSS}	V_{GS}=±30 V, V_{DS}= 0 V			10	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	I_D = 5A, V_{GS}=10 V			1.0	1.2	Ω

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

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Dynamic ratings

Description	Symbol	Conditions	Characteristics Min.	Typ.	Max.	Unit
Forward transconductance	g f s	I_D = 5A, V_{DS} = 25V	3.0	6.0		S
Input capacitance	C iss	V_{DS} = 25V, V_{GS} = 0V, f = 1MHz		1500	2250	pF
Output capacitance	C oss			200	300	pF
Reverse transfer capacitance	C rss			100	150	pF
Turn-on time	t d(on)	V_{CC} = 600V, V_{GS} = 10V, I_D = 10A, R_{GS} = 25Ω		40	60	ns
	t r			120	180	ns
Turn-off time	t d(off)			240	360	ns
	t f			110	165	ns

Reverse diode

Description	Symbol	Conditions	Characteristics Min.	Typ.	Max.	Unit
Continuous reverse drain current	I_{DR}	Tc = 25℃			10	A
Pulsed reverse deain current	I_{DRM}	Tc = 25℃			30	A
Diode forward on-voltage	V_{SD}	$I_F = 2 \times I_{DR}$, V_{GS} = 0 V, T_{ch} = 25℃		0.96	1.44	V
Reverse recovery time	t_{rr}	$I_F = I_{DR}$, dI_F/dt = 100A/μS, T_{ch} = 25℃				ns
Reverse recovery charge	Q_{rr}					μC

5. Thermal resistance

Description	Symbol	Conditions	Characteristics Min.	Typ.	Max.	Unit
Thermal resistance	$R th_{ch-c}$				0.83	℃/W
	$R th_{ch-a}$				35.0	℃/W

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6. 御注意 (Attention)

本製品は外国為替および外国貿易管理法の規定により戦略物資（または役務）に該当しますので、輸出する場合には、同法に基づく通商産業大臣の輸出許可が必要です。

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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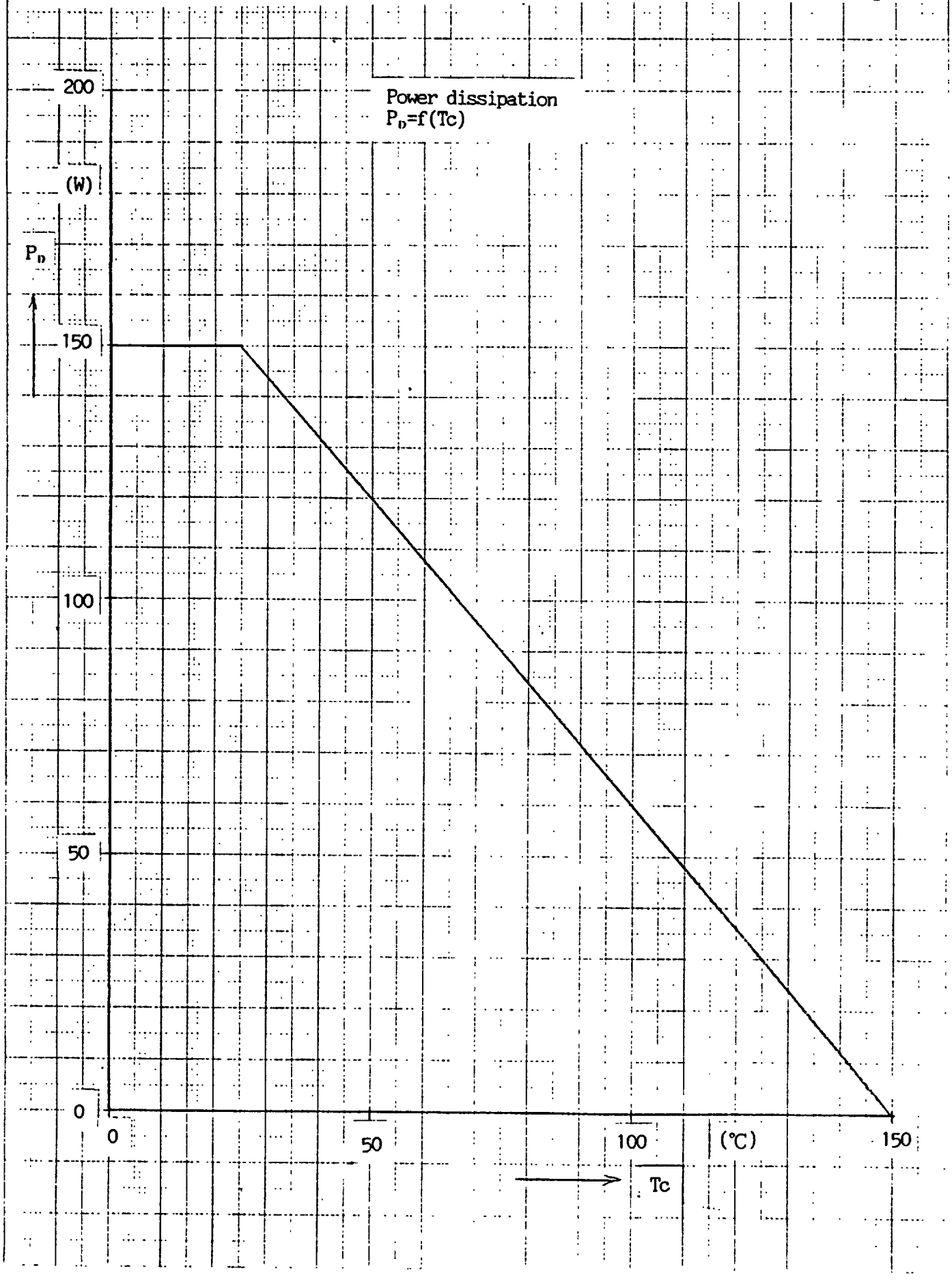
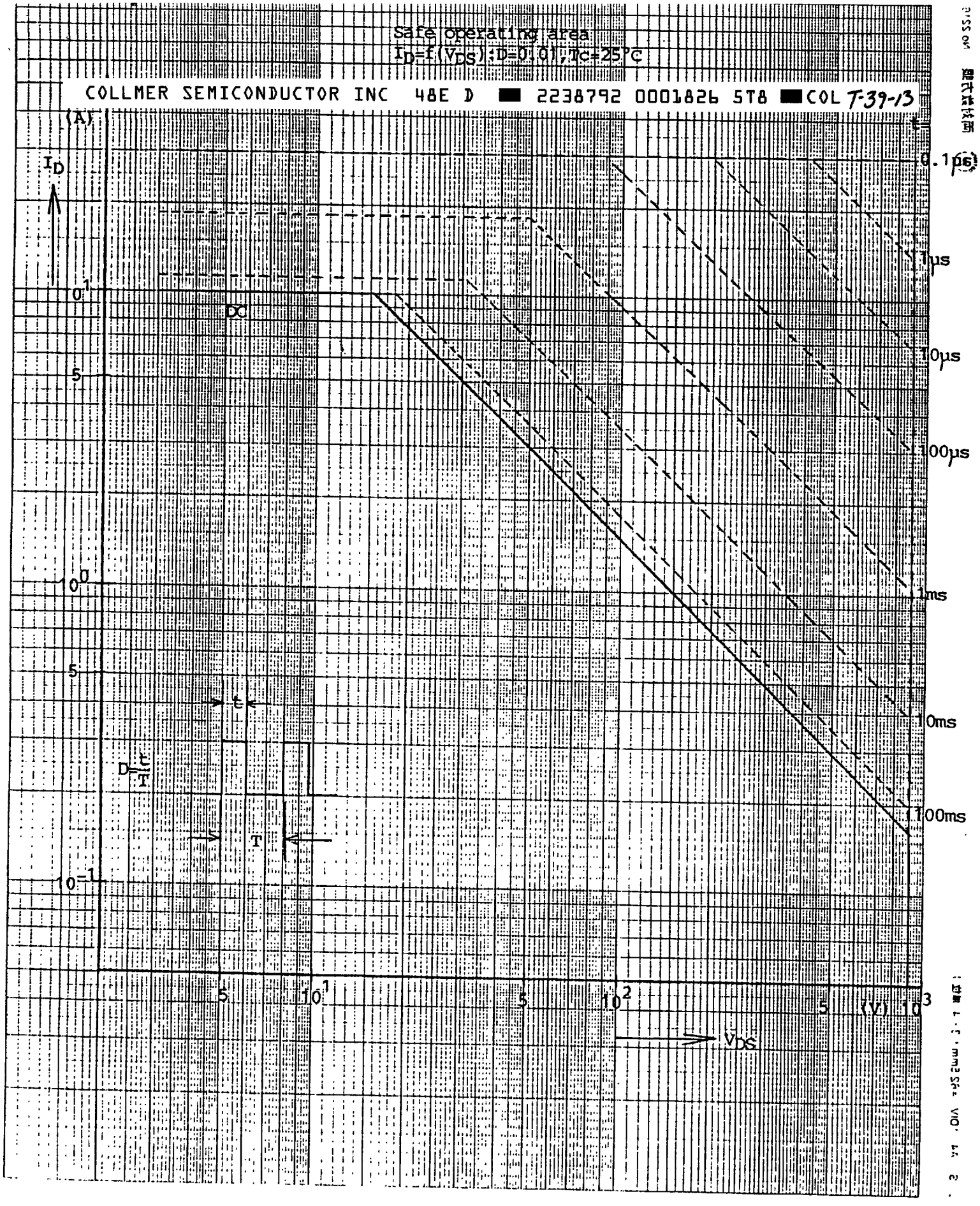
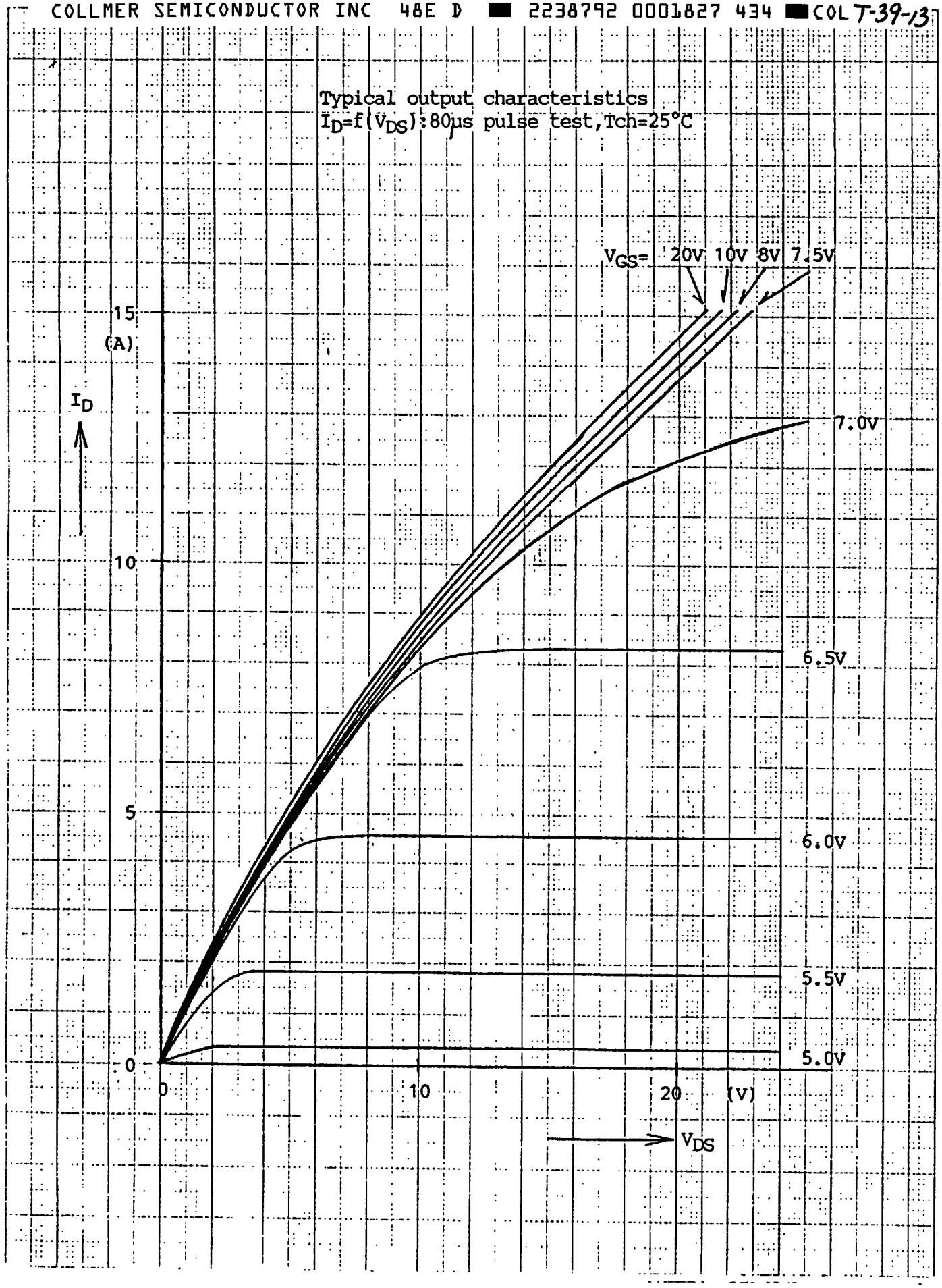
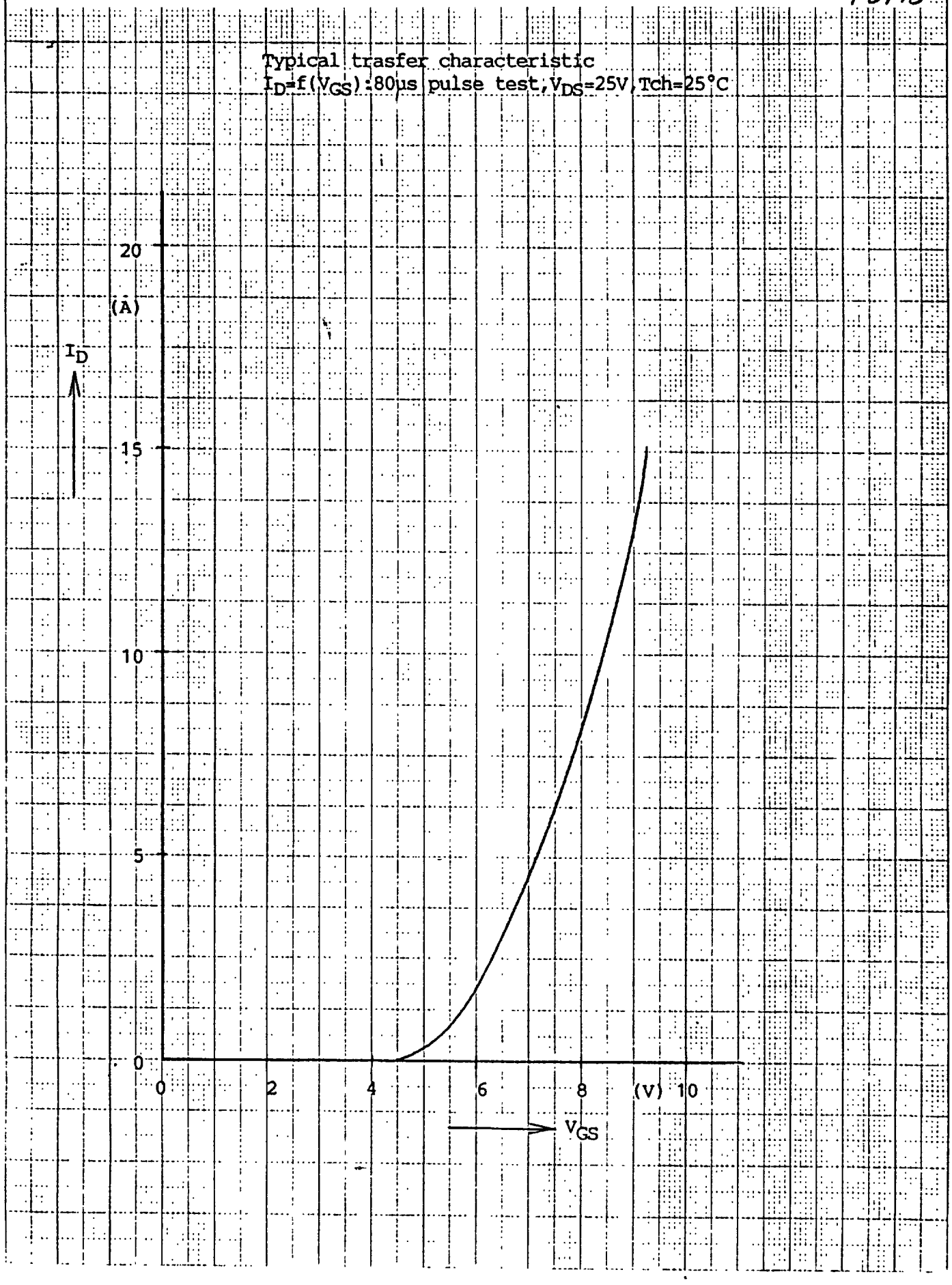
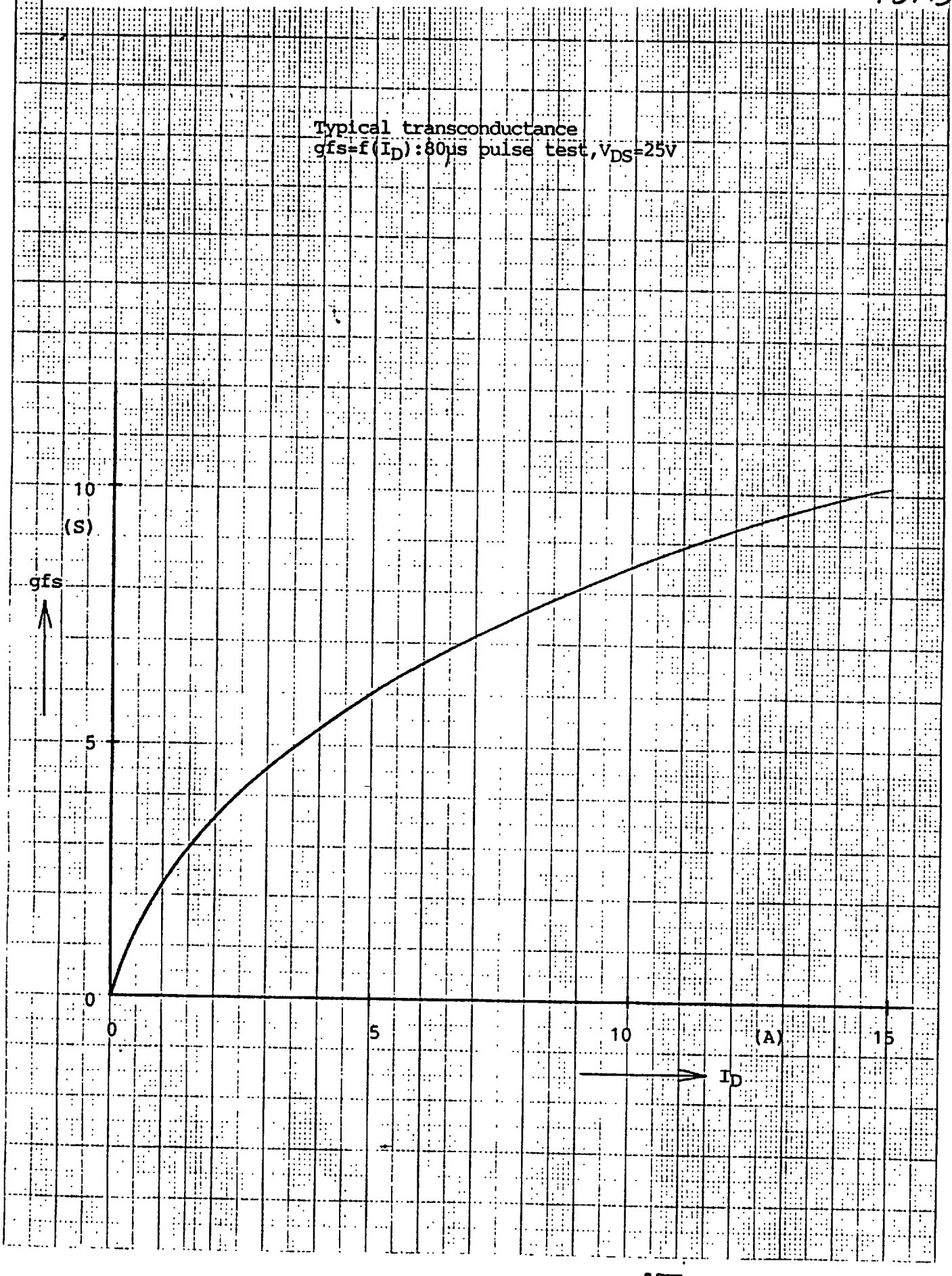

Power dissipation
P_D=f(Tc)
200
(W)
P_D
150
100
50
0
0
50
100
(℃)
150
Tc

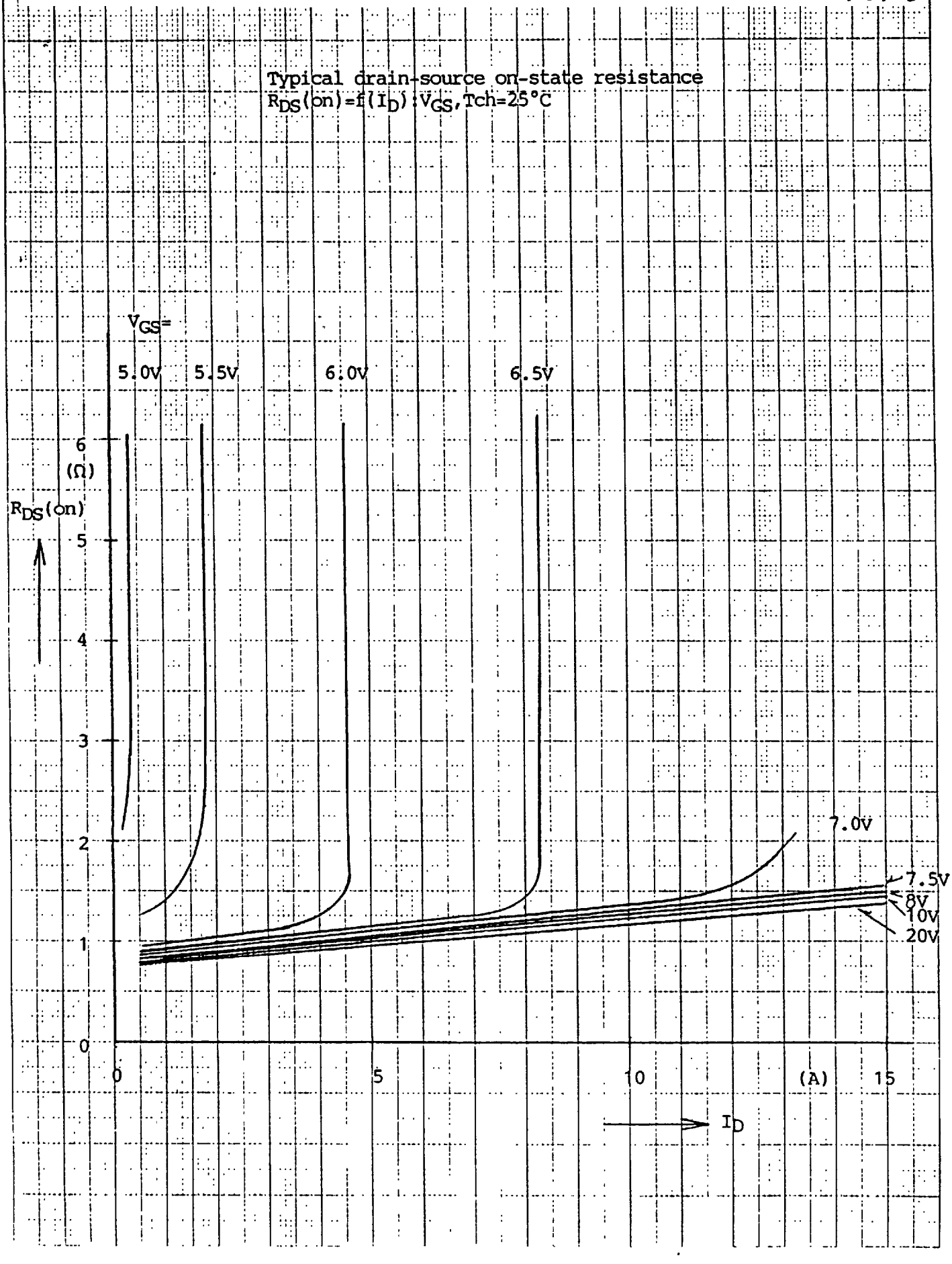

Safe operating area
$I_D=f(V_{DS}):D=0.01,Tc=25°C$
COLLMER SEMICONDUCTOR INC 48E D 2238792 0001826 5T8 COL T-39-13
(A)
I_D
10^1
DC
5
10^0
5
10^{-1}
$D=\frac{t}{T}$
t
T
0.1μs
1μs
10μs
100μs
1ms
10ms
100ms
5
10^1
5
10^2
5
(V) 10^3
V_{DS}

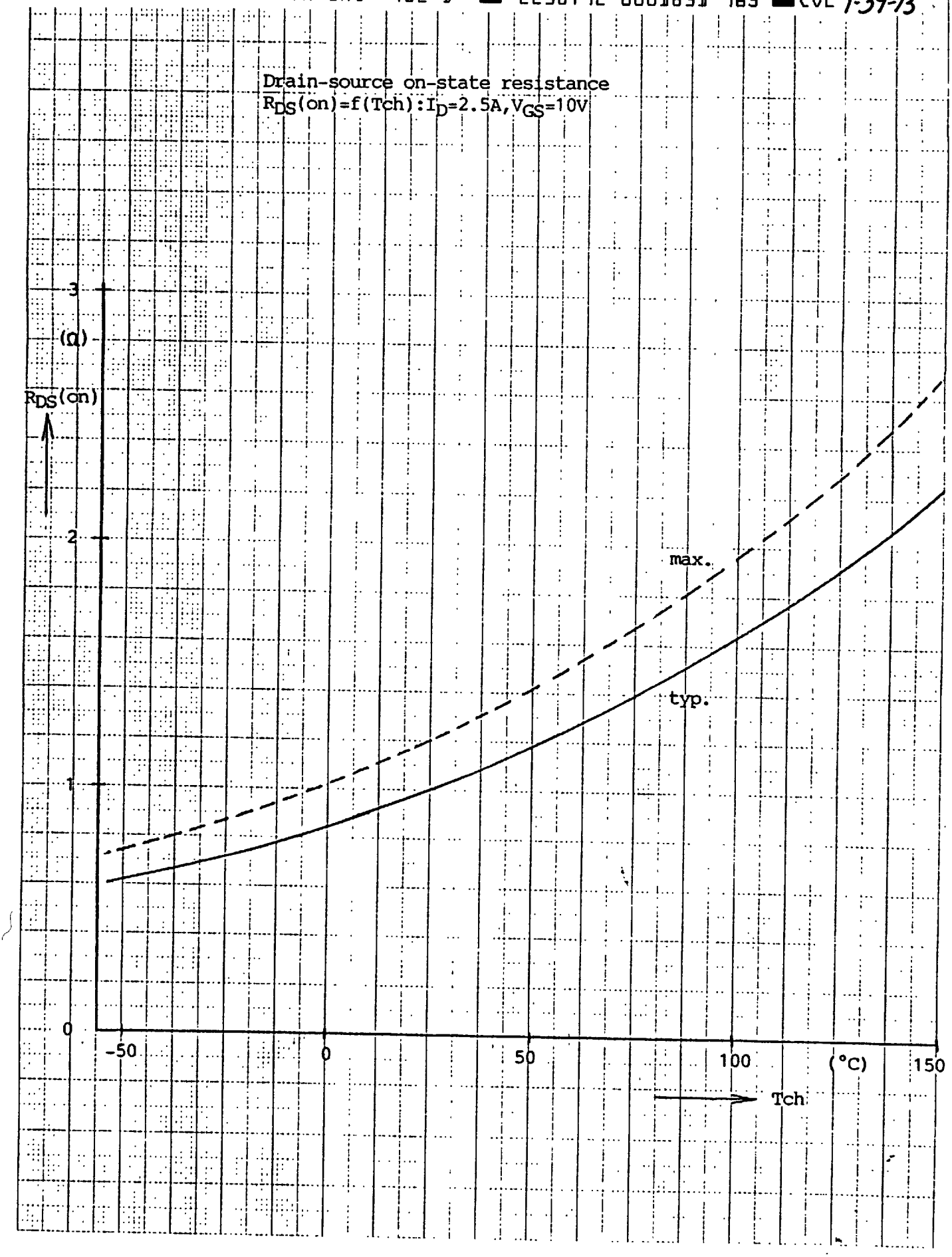

Typical output characteristics
$I_D=f(V_{DS})$: 80µs pulse test, Tch=25°C
V_{GS}= 20V 10V 8V 7.5V
7.0V
6.5V
6.0V
5.5V
5.0V
I_D
(A)
15
10
5
0
0
10
20
(V)
V_{DS}

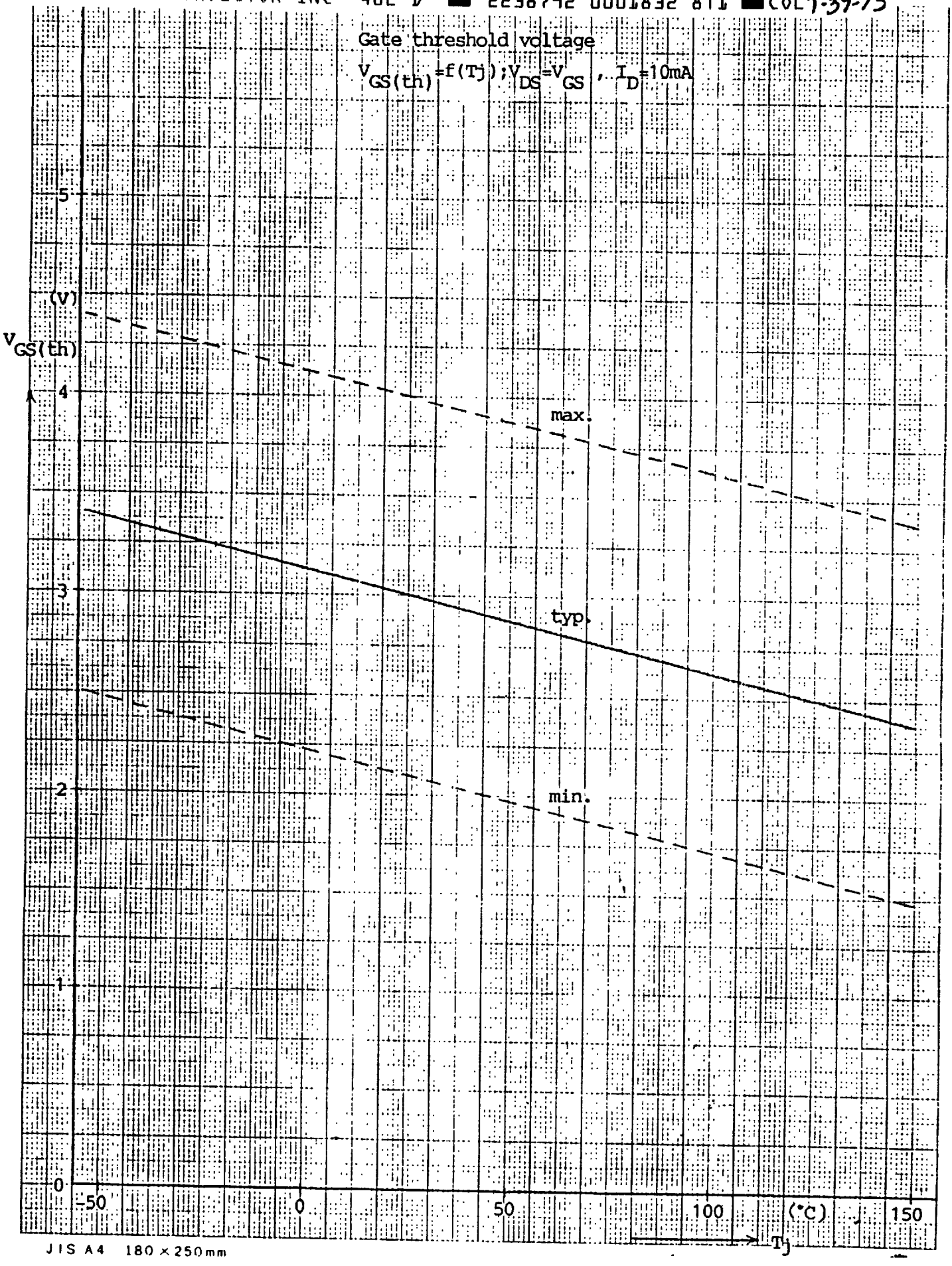

Typical trasfer characteristic
I_D=f(V_{GS}):80µs pulse test,V_{DS}=25V,Tch=25°C
20
(A)
I_D
15
10
5
0
0
2
4
6
8
(V)
10
V_{GS}


Typical transconductance
gfs=f(I_D):80µs pulse test,V_DS=25V
gfs
(S)
10
5
0
0
5
10
15
(A)
I_D

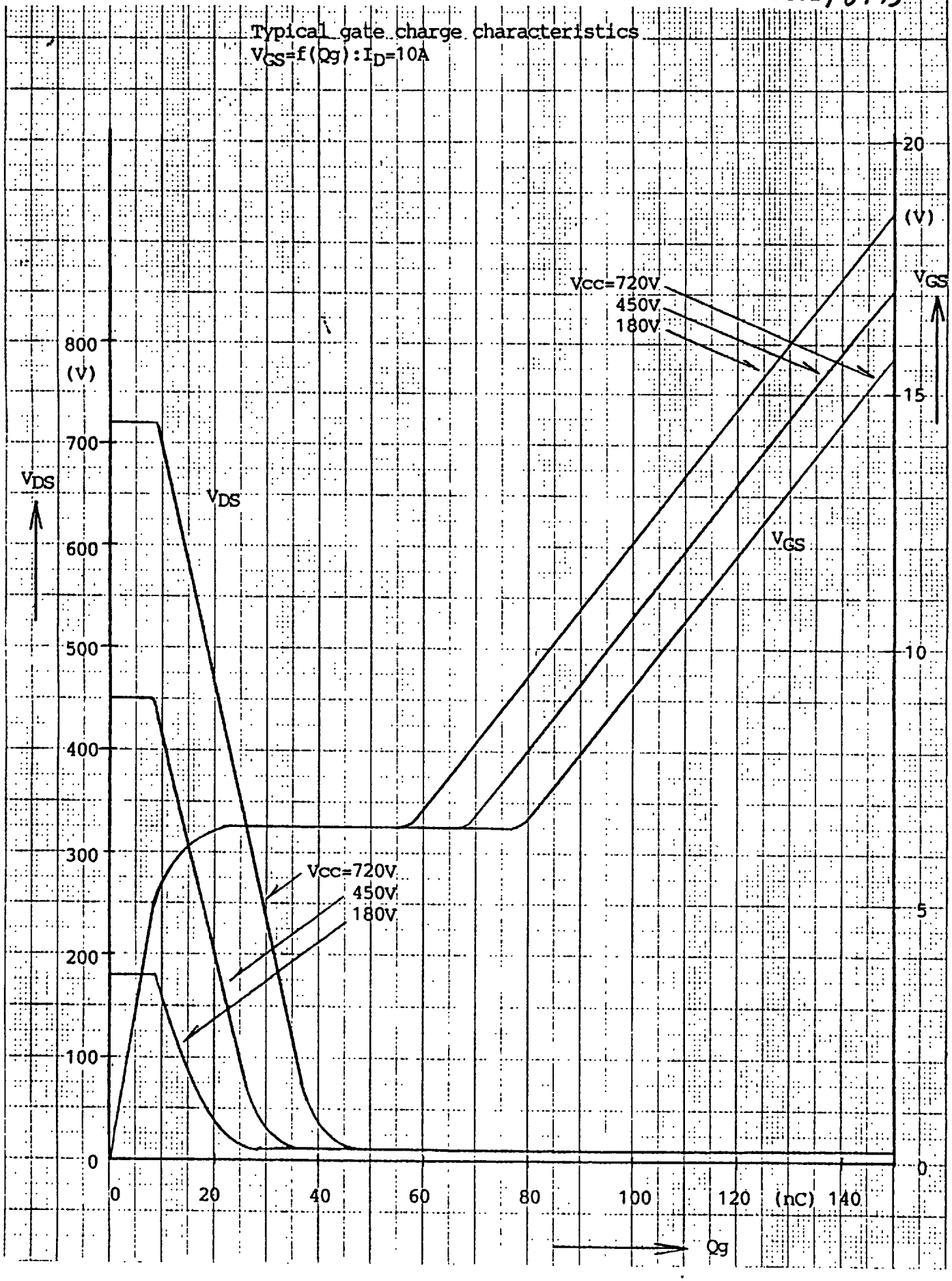
Typical drain-source on-state resistance
$R_{DS(on)}=f(I_D);V_{GS},Tch=25°C$

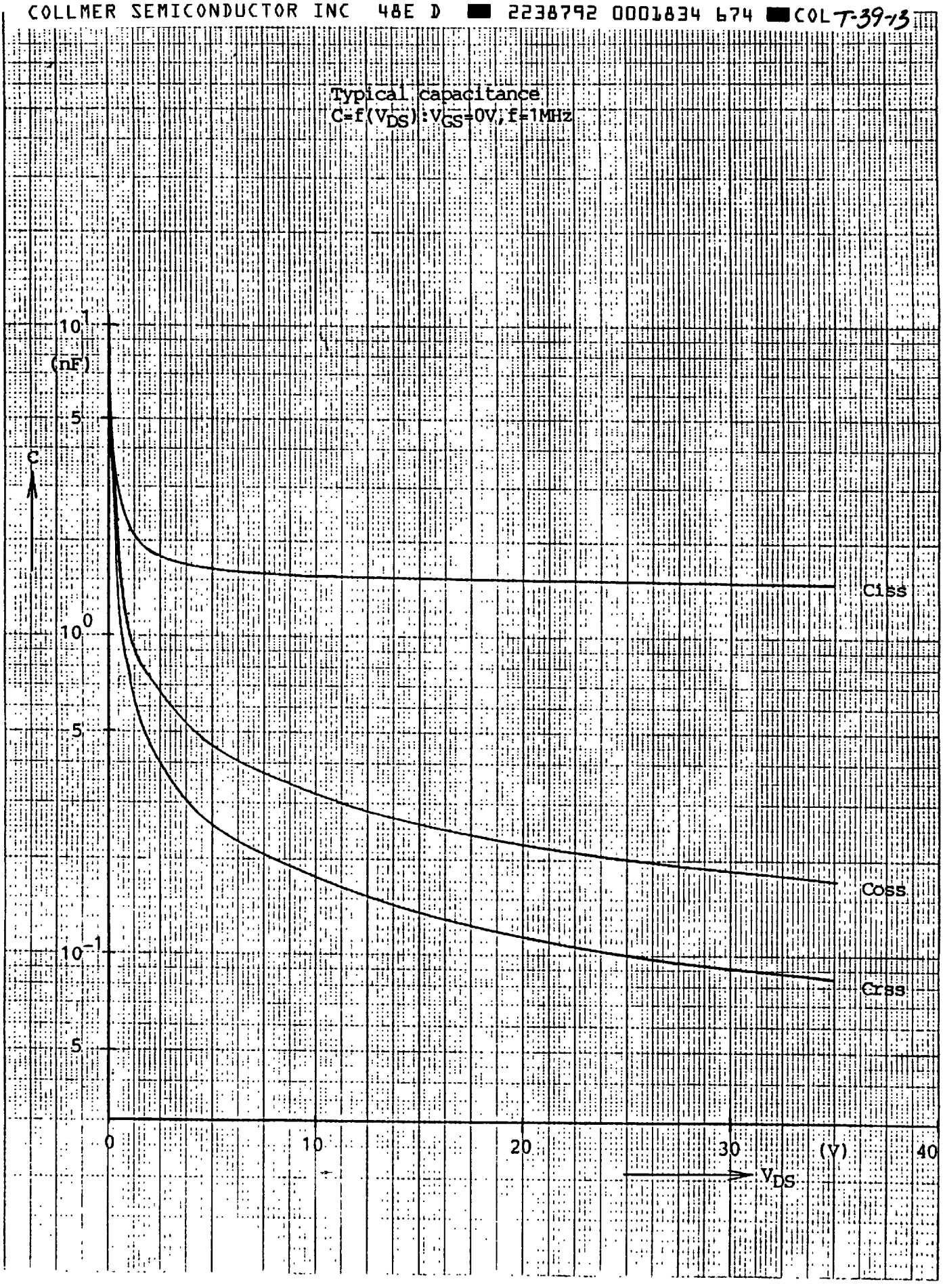


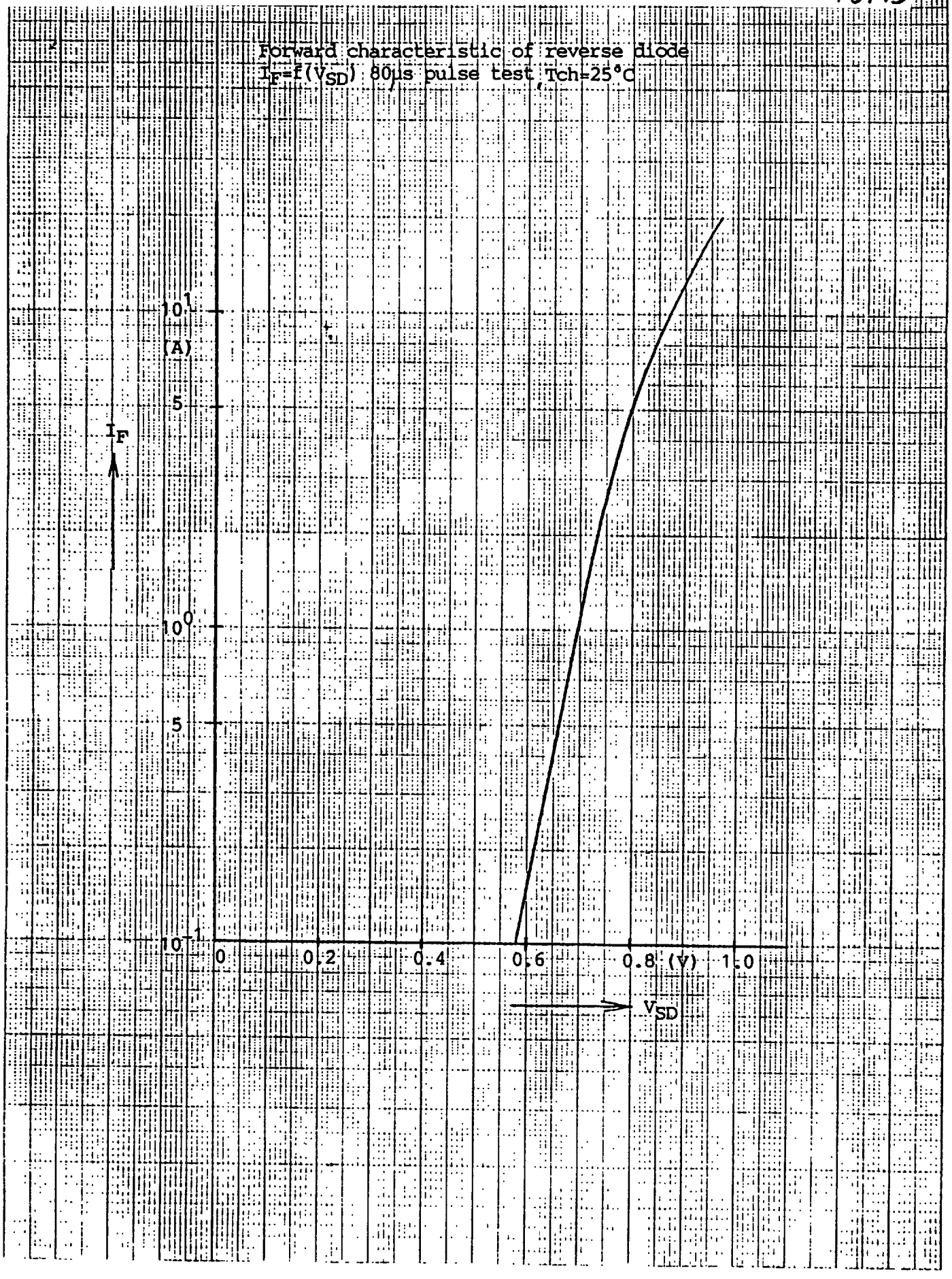

Drain-source on-state resistance
$R_{DS}(on)=f(Tch):I_D=2.5A,V_{GS}=10V$
$R_{DS}(on)$
(Ω)
3
2
1
0
max.
typ.
-50
0
50
100
150
(°C)
Tch

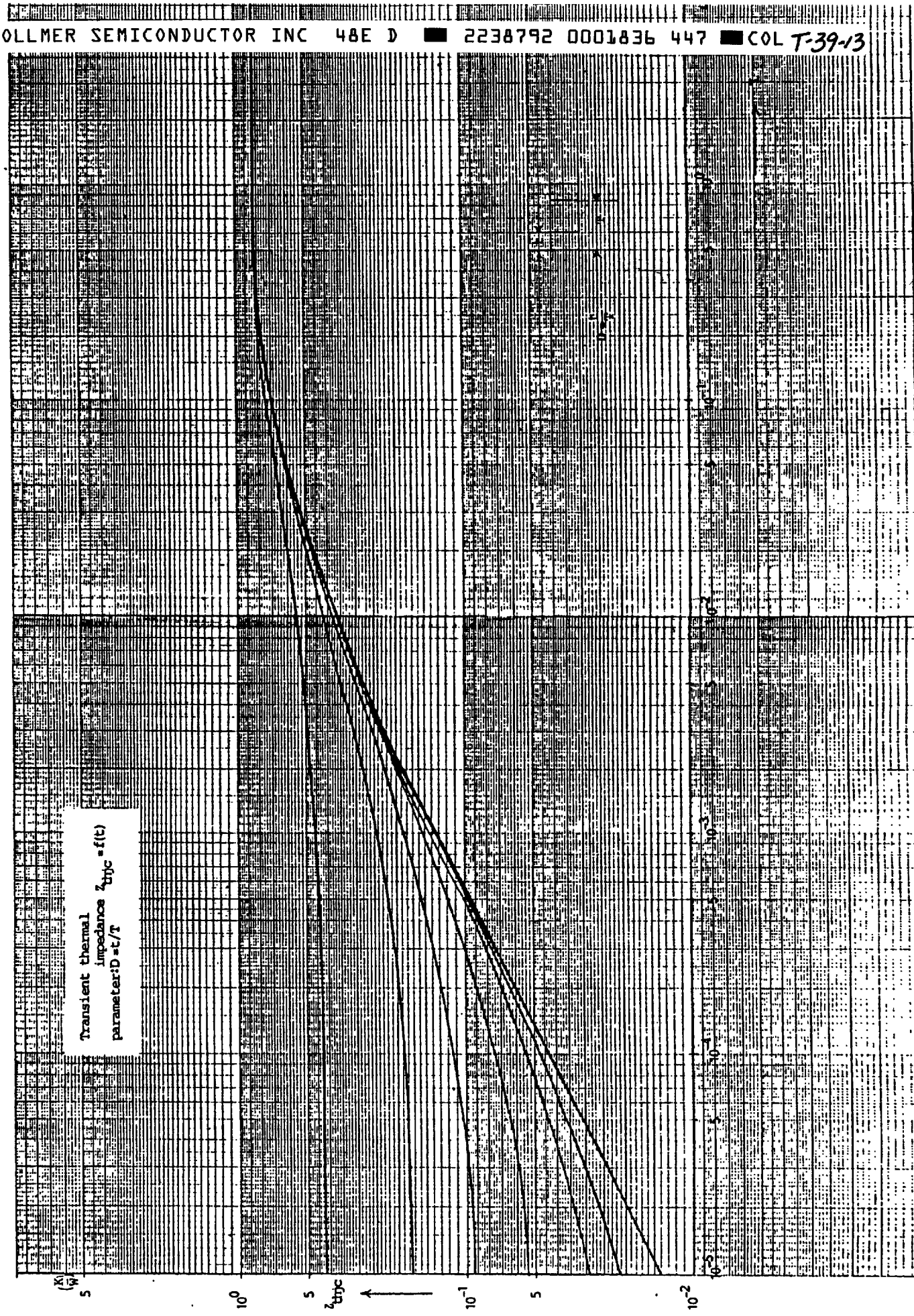


JIS A4 180 × 250mm


Typical gate charge characteristics
V_{GS}=f(Qg):I_D=10A
800
(V)
700
V_{DS}
600
500
400
300
200
100
0
V_{DS}
Vcc=720V
450V
180V
20
(V)
V_{GS}
15
10
5
0
V_{GS}
0
20
40
60
80
100
120
(nC)
140
Qg

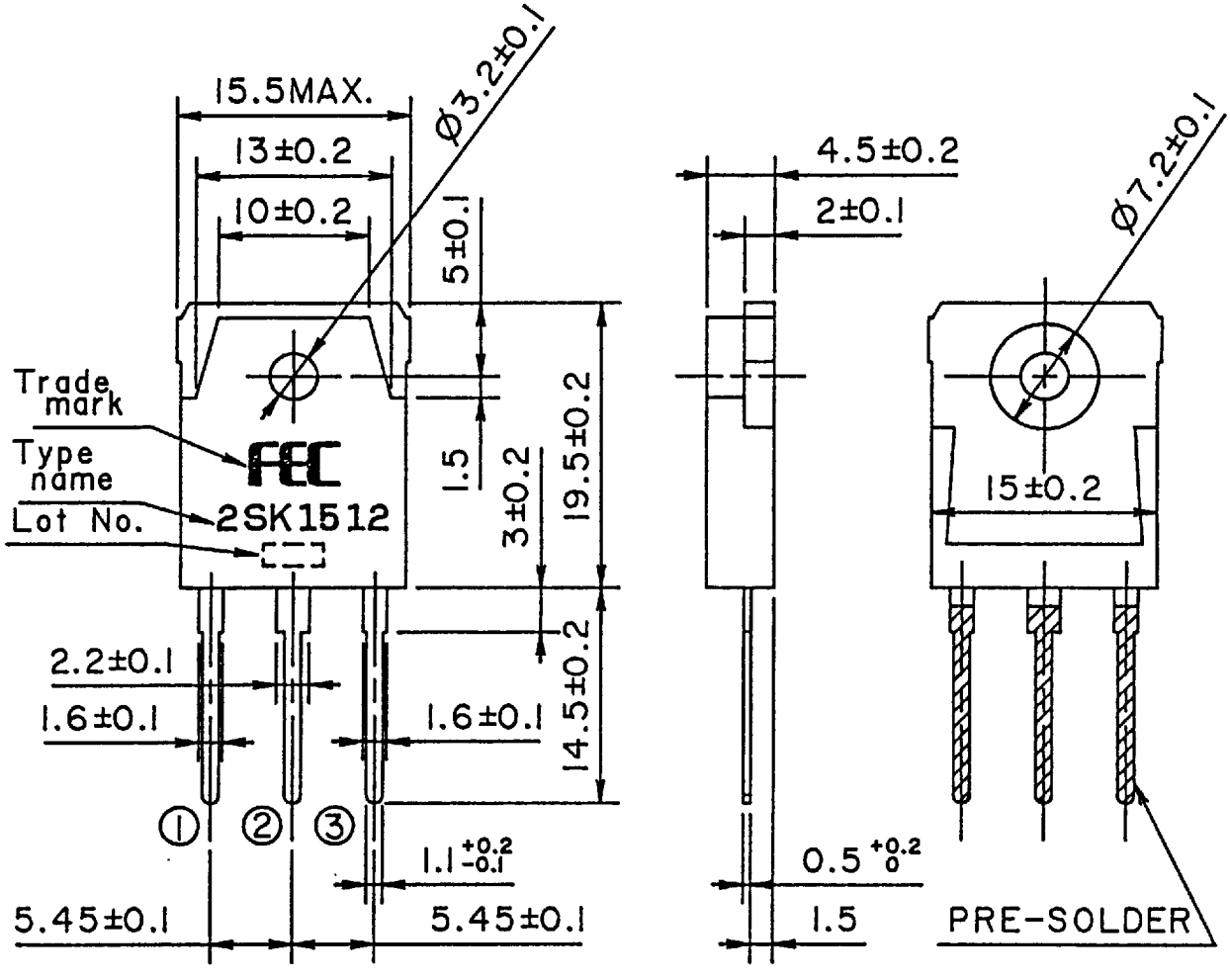

Typical capacitance
C=f(VDS):VGS=0V, f=1MHz
C
(nF)
10^1
5
10^0
5
10^-1
5
0
10
20
30
(V)
40
VDS
Ciss
Coss
Crss


Forward characteristic of reverse diode
$I_F=f(V_{SD})$ 80µs pulse test Tch=25°C
10^1
(A)
5
I_F
10^0
5
10^{-1}
0
0.2
0.4
0.6
0.8 (V)
1.0
V_{SD}


Transient thermal impedance $z_{thjc} = f(t)$
parameter: $D = t/T$
z_{thjc}
$(\frac{K}{W})$
10^0
10^{-1}
10^{-2}
5
$D = 0.5$
$D = 0.2$
$D = 0.1$
$D = 0.05$
$D = 0.02$
$D = 0.01$
$D = 0$

FUJI POWER MOS FET

TYPE : 2SK1512



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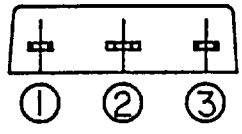

CONNECTION

① GATE
② DRAIN
③ SOURCE

JEDEC : TO-228AA
EIAJ : SC-65

MS.T03P.2SK1512-E

	DATE	NAME	APPROVED
DRAWN	1990-05-26	MARUYAMA	M. Mujagi
CHECKED	1990-05-26	ARAI	

REVISIONS

Fuji Electric Co.,Ltd.

DWG.NO. MK5C25624