Fuji power MOSFET Specification

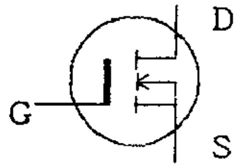
2SK1016

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 Tc=25 ℃ (unless otherwise specified)

Desctiption	Symbol	Characteristics	Unit	Remarks
Drain-source voltage	V_{DS}	500	V	
Drain-gate voltage	V_{DGR}	500	V	R_{GS}=20KΩ
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	T_j	150	℃	
temperature range	T_{stg}	-55 ～ +150	℃	

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

Static ratings

Description	Symbol	Conditions		Characteristics			Unit
				Min.	Typ.	Max.	
Drain-source breakdown voltage	BV_{DSS}	I_D =1mA V_{GS}=0V		500			V
Gate threshold voltage	$V_{GS(th)}$	I_D =1mA V_{DS}= V_{GS}		2.5	3.5	5.0	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=500V V_{GS}=0V	Tj= 25℃		10	500	μA
	I_{DSS}		Tj=125℃		0.2	1.0	mA
Gate-source leakage current	I_{GSS}	V_{GS}=±30V V_{DS}=0V			10	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	I_D =8A V_{GS}=10V			0.36	0.55	Ω

	DATE	NAME	APPROVED
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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	10.0		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}=25Ω		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 corrent	I_{DR}				15	A
Pulsed reverse deain corrent	I_{DRM}				40	A
Diode forward on-voltage	V_{SD}	I_F = 2 × I_{DR} V_{GS}=0V, Tj = 25℃		1.1	1.65	V
Reverse recovery time	t_{rr}	I_F = I_{DR} V_{GS}=0V $-dI_F/dt$ =100A/μs Tj = 25℃		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	℃/W
	$R_{th\ j-a}$				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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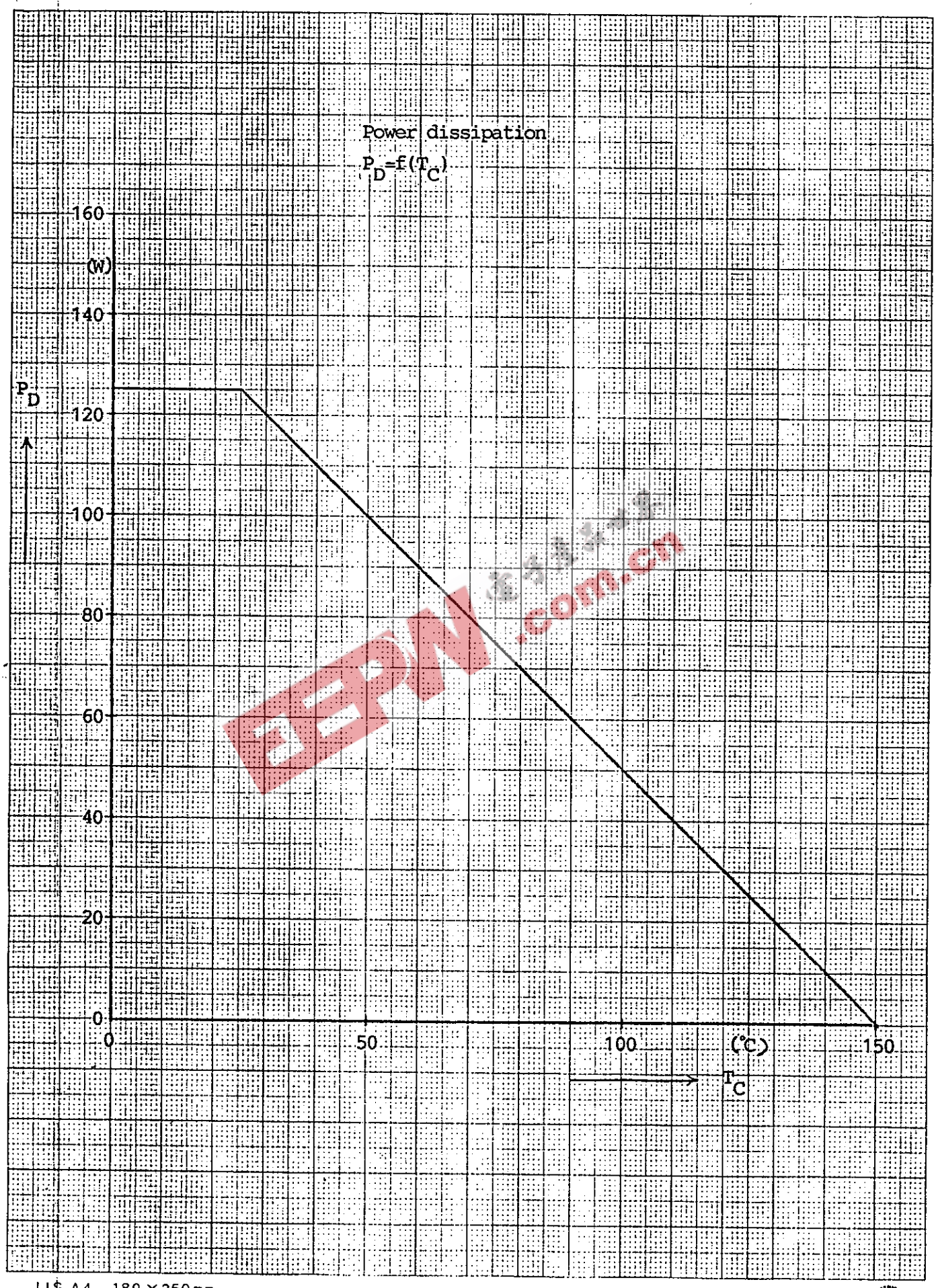
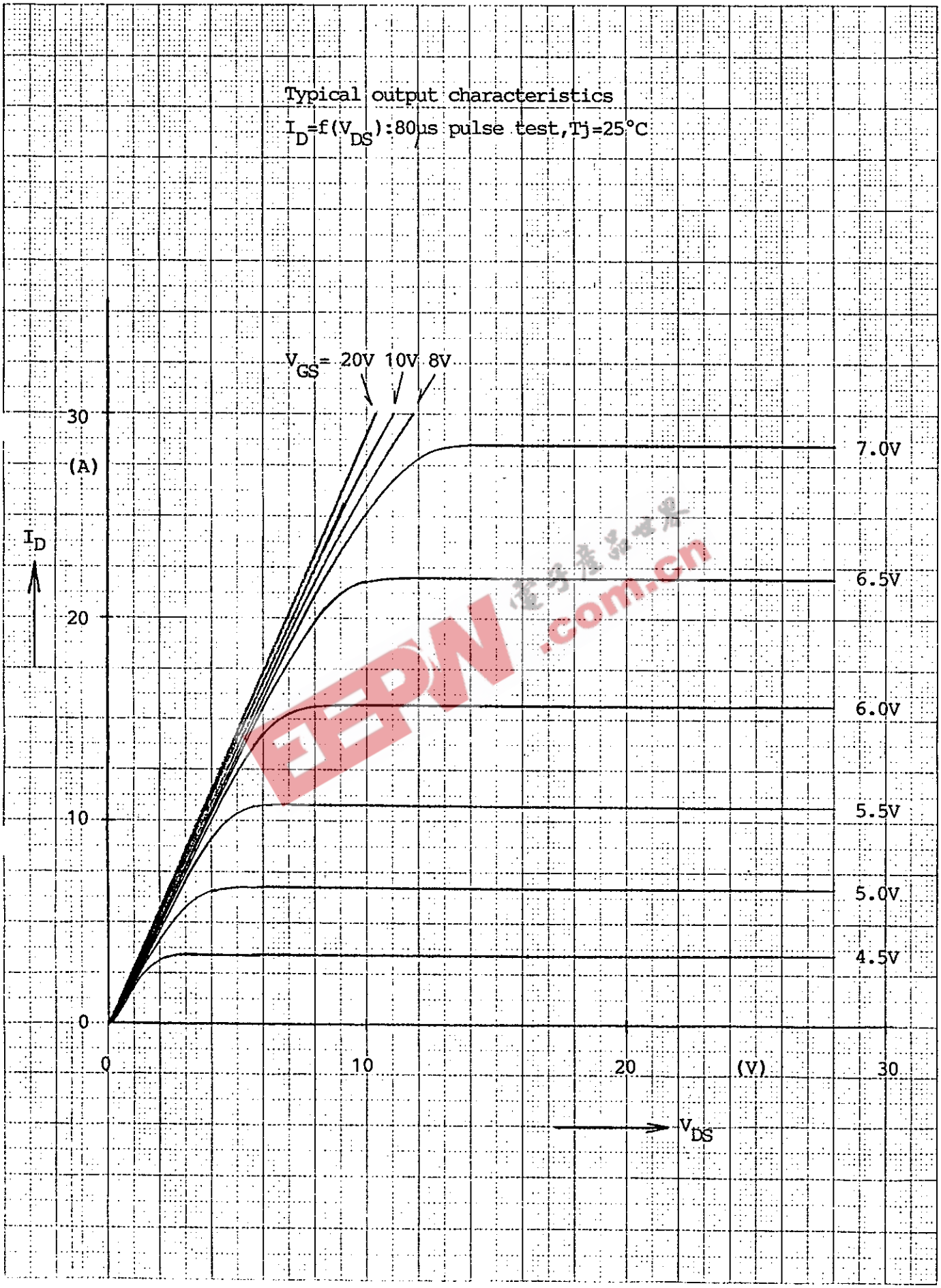


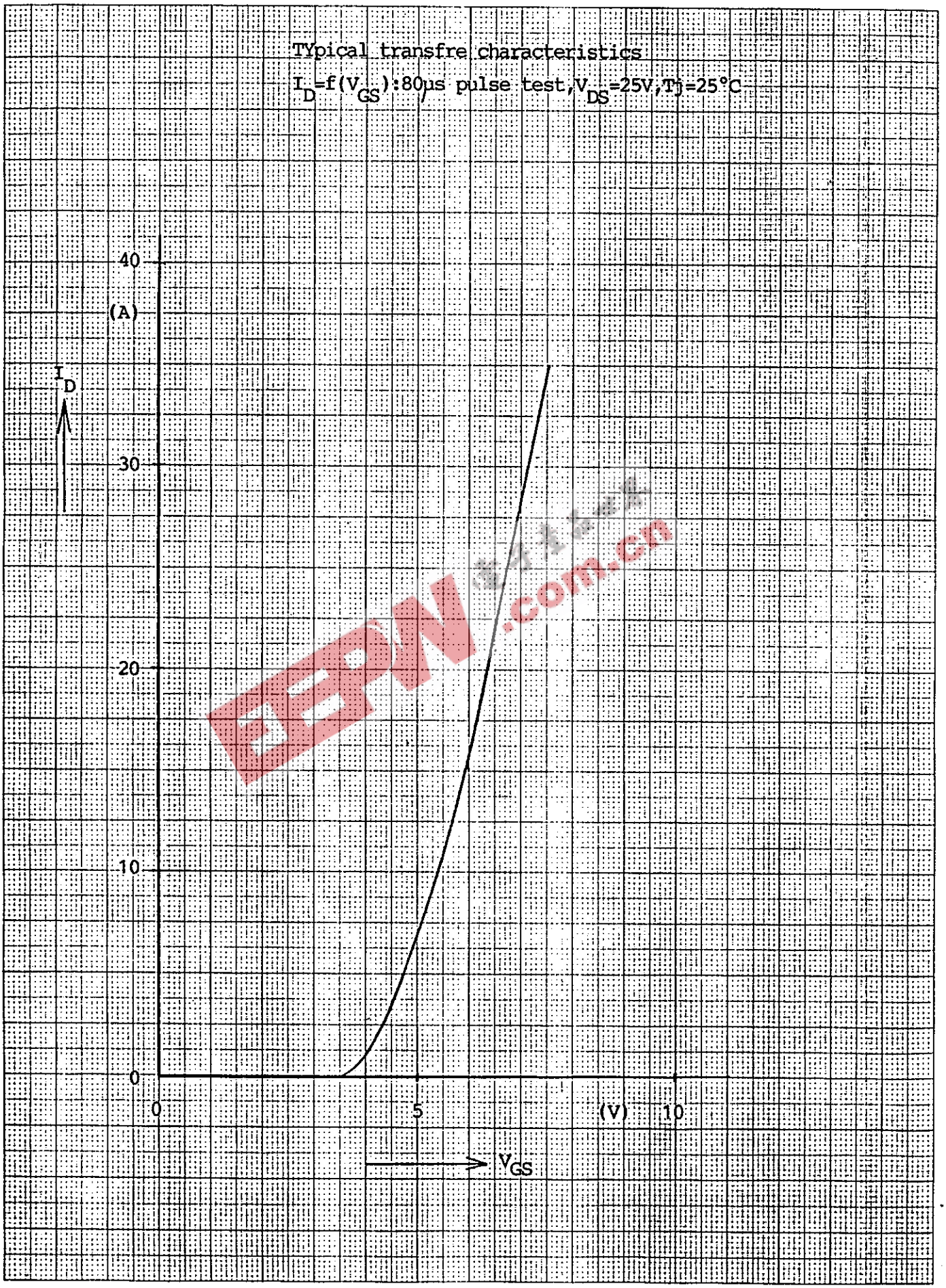
JIS A4 180×250mm


Safe operating area
ID=f(VDS);D=0.01,Tc=25°C
ID
(A)
5
10^1
5
10^0
5
10^-1
DC
t=
0.1μs
1μs
10μs
100μs
1ms
10ms
100ms
D=t/T
t
T
5
10^1
5
10^2
5
(V)
10^3
VDS


Typical output characteristics
I_D=f(V_{DS}):80μs pulse test,Tj=25°C
V_{GS}= 20V 10V 8V
7.0V
6.5V
6.0V
5.5V
5.0V
4.5V
30
(A)
I_D
20
10
0
0
10
20
(V)
30
V_{DS}

TYpical transfre characteristics

$I_D=f(V_{GS})$:80μs pulse test,V_{DS}=25V,Tj=25°C



JIS A4 180×250mm

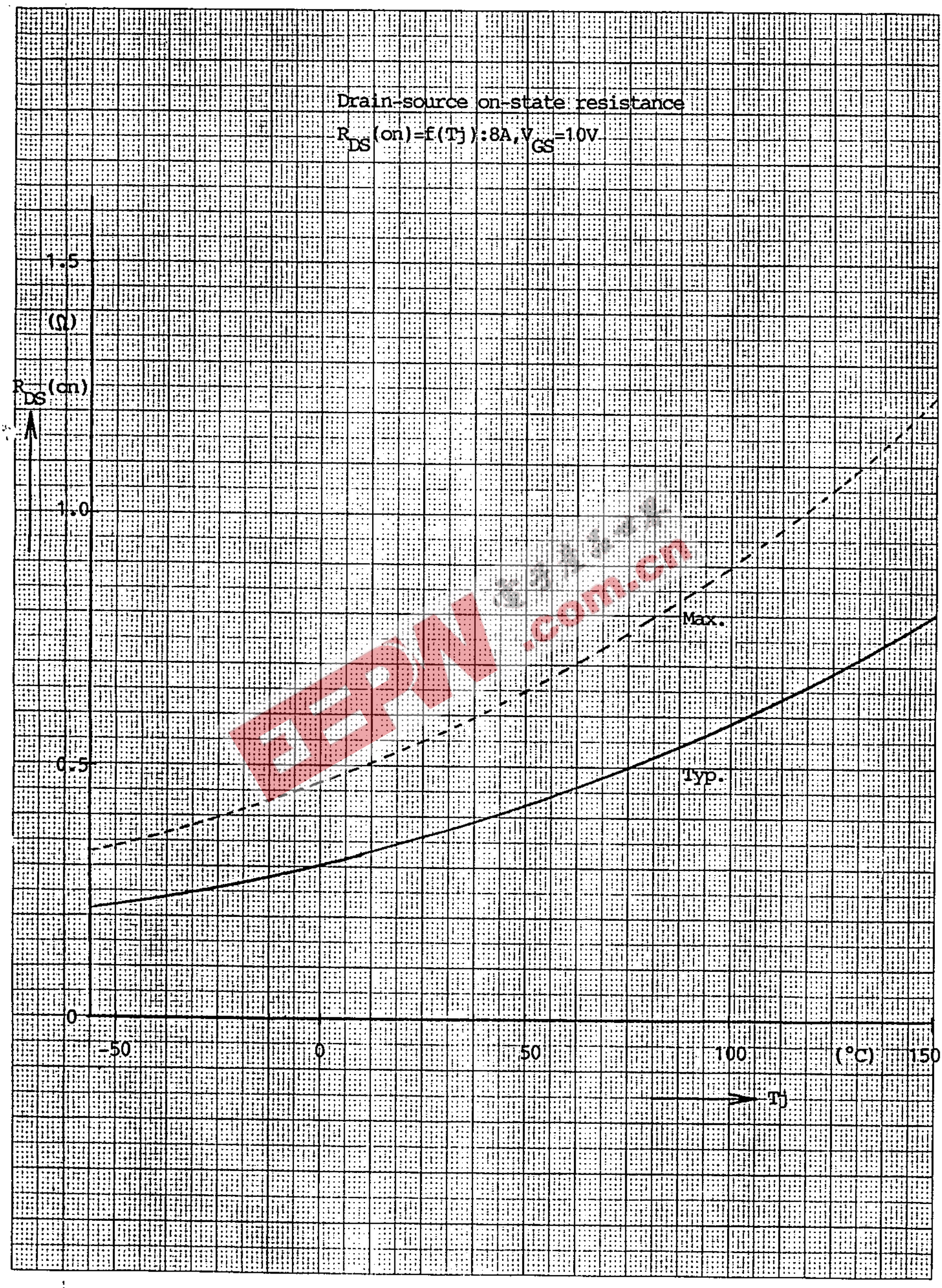
1 枚目

Typical transconductance

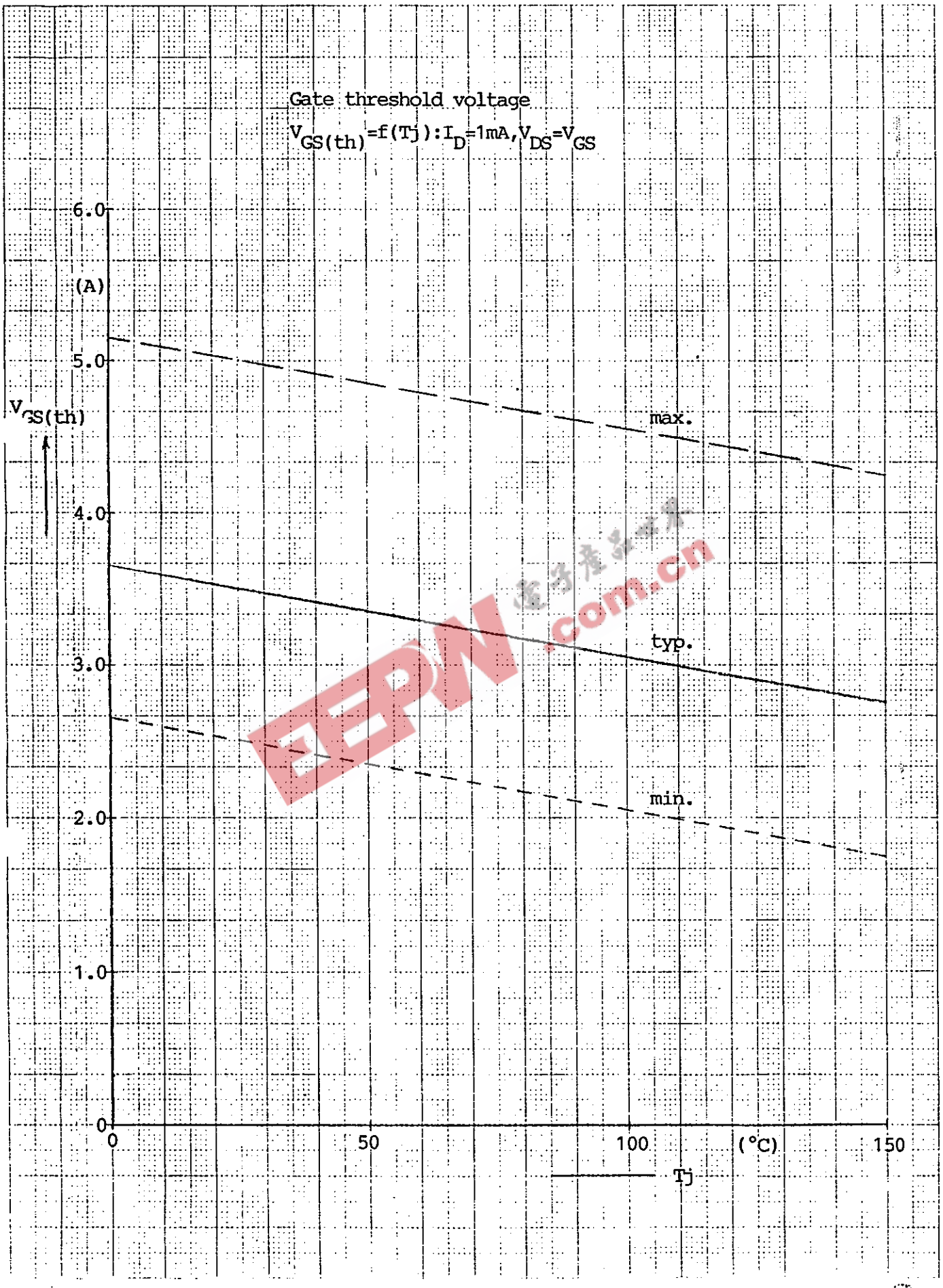
gfs=f(I_D):80us pulse test,V_{DS}=25V ,Tj=25°C

Typical drain-source on-state resistance

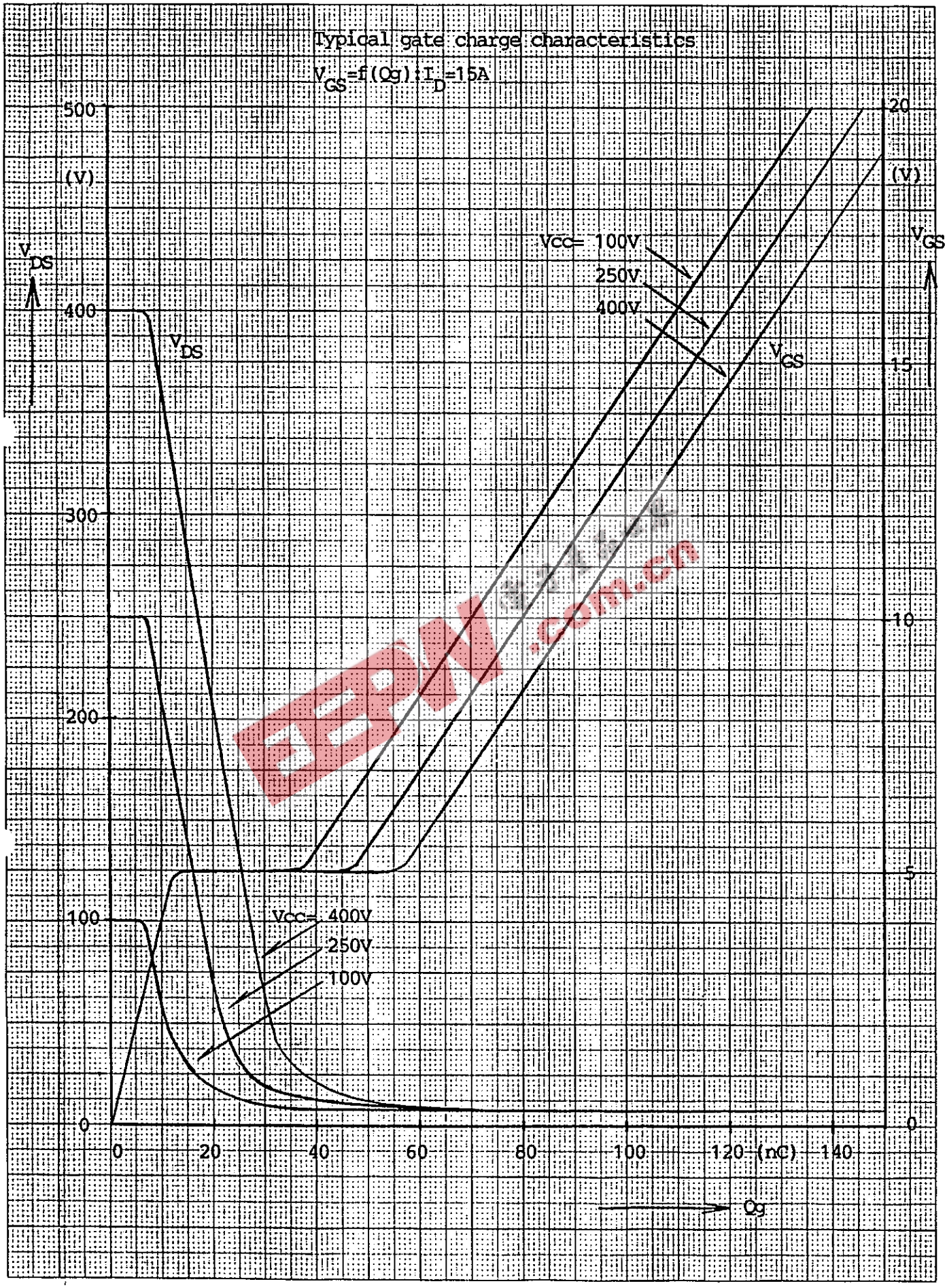
$R_{DS}(on)=f(I_D):V_{GS}, Tj=25°C$

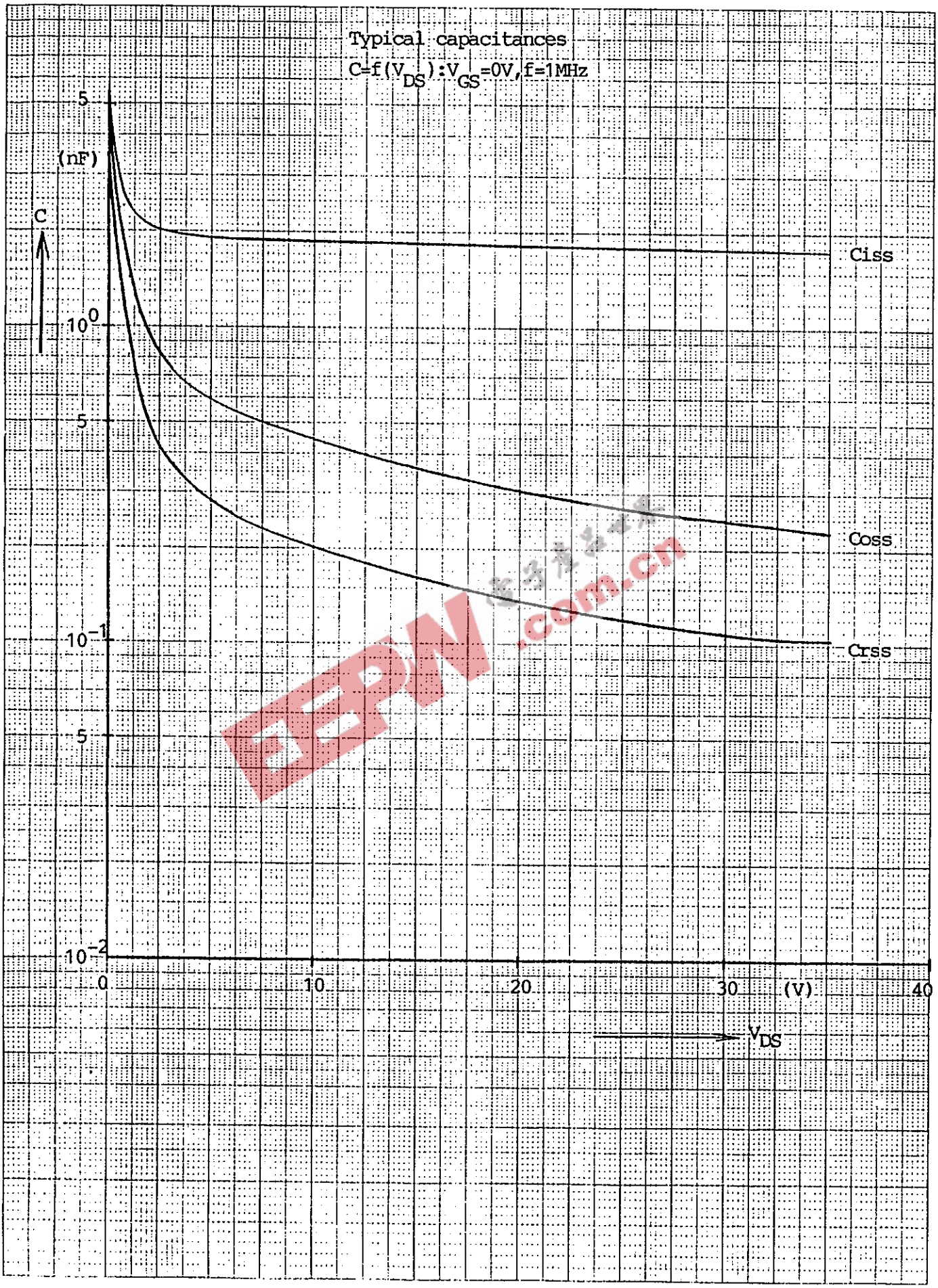


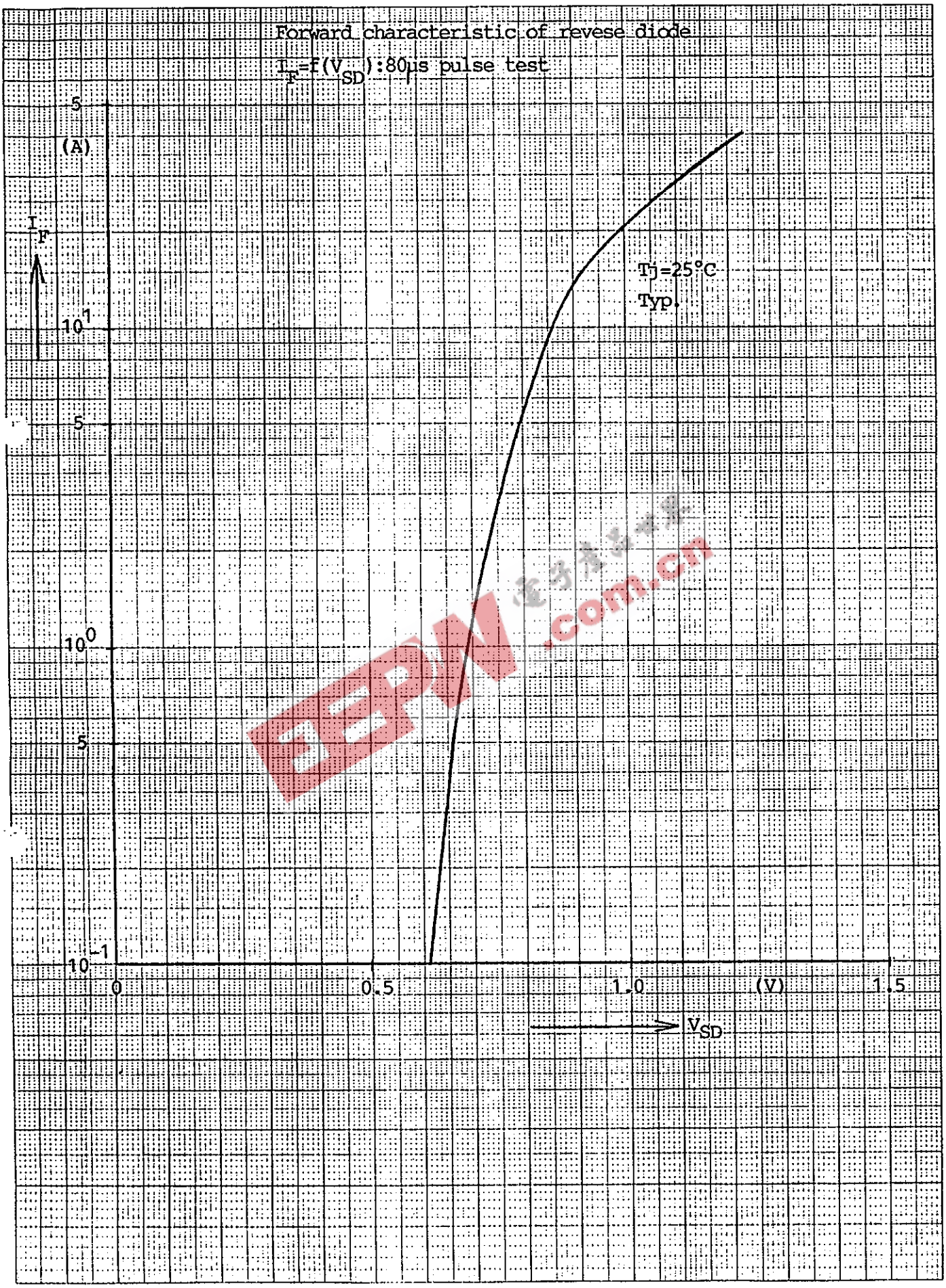
Drain-source on-state resistance
R_{DS}(on)=f(Tj):8A,V_{GS}=10V
1.5
(Ω)
R_{DS}(on)
1.0
0.5
0
Max.
Typ.
-50
0
50
100
(°C)
150
Tj

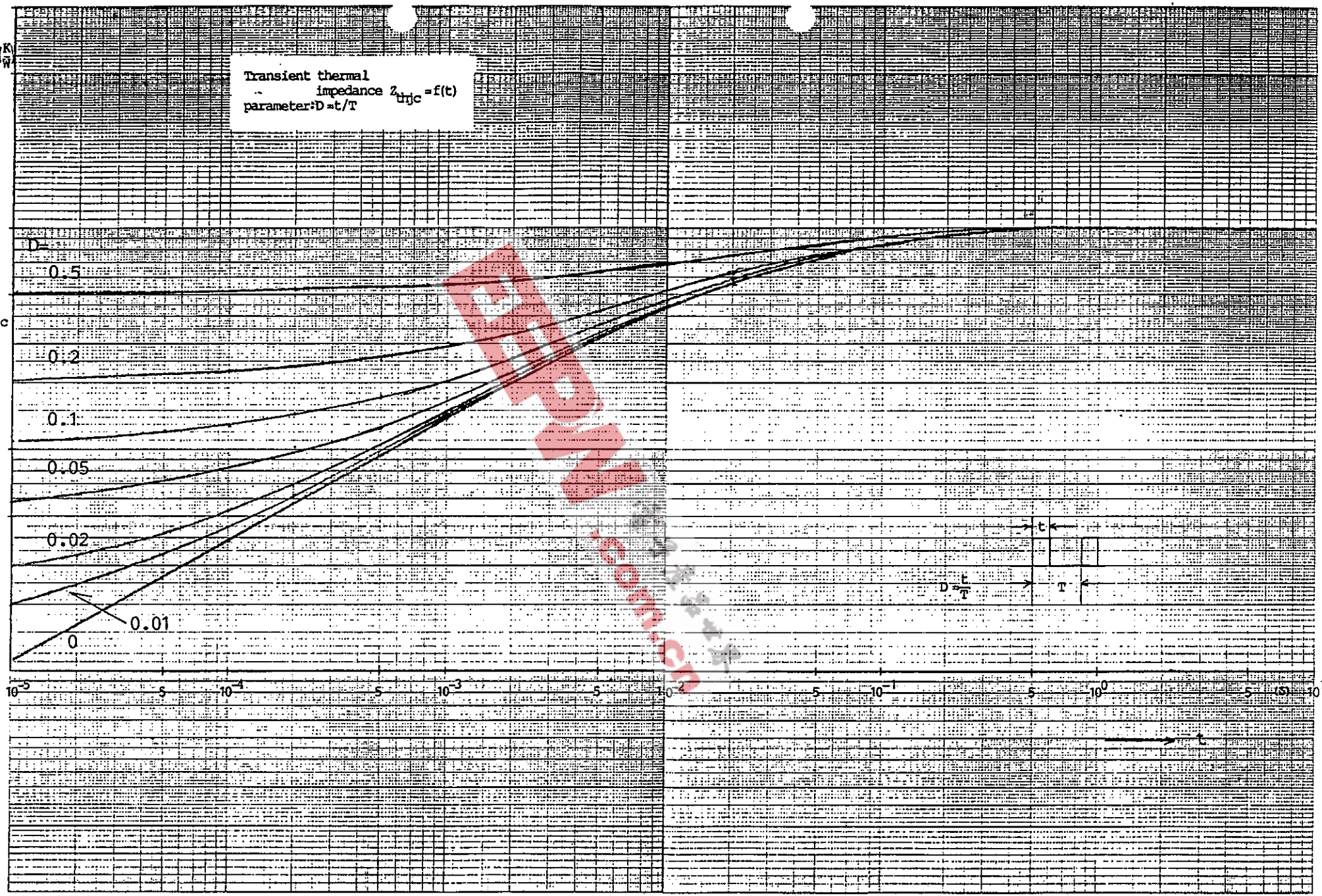


JIS A4 180×250mm


Typical gate charge characteristics
V_{GS}=f(Qg):I_D=15A
500
(V)
V_{DS}
400
300
200
100
0
0
20
40
60
80
100
120
(nC)
140
Qg
20
(V)
V_{GS}
15
10
5
0
Vcc= 100V
250V
400V
V_{DS}
V_{GS}
Vcc= 400V
250V
100V

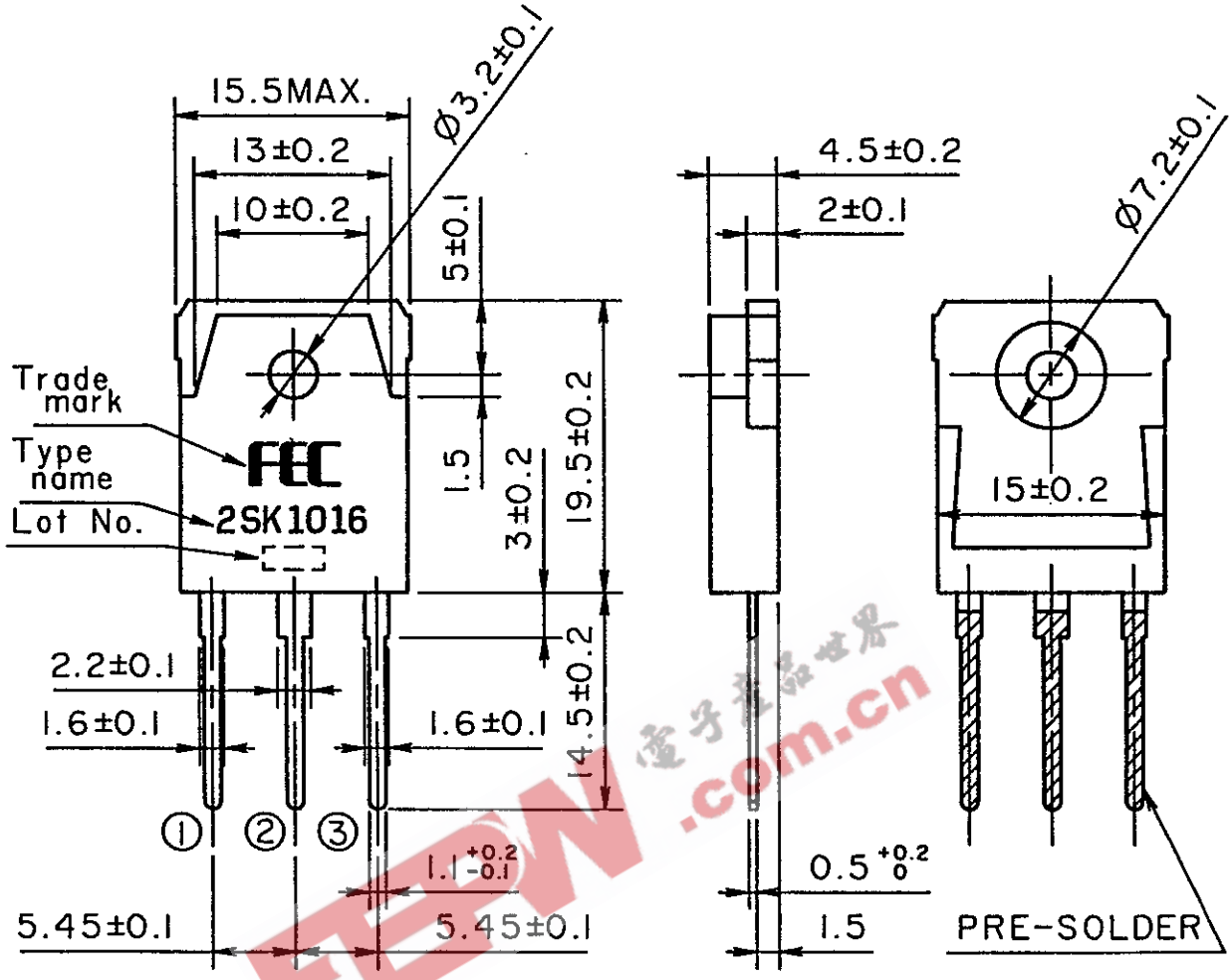

Typical capacitances
C=f(VDS):VGS=0V,f=1MHz
C
(nF)
5
10^0
5
10^-1
5
10^-2
Ciss
Coss
Crss
0
10
20
30
(V)
40
VDS


Forward characteristic of revese diode
$I_F=f(V_{SD})$:80μs pulse test
5
(A)
I_F
10^1
5
10^0
5
10^{-1}
0
0.5
1.0
(V)
1.5
V_{SD}
Tj=25°C
Typ.

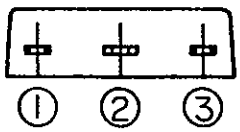

Transient thermal impedance $Z_{thjc} = f(t)$
parameter: $D = t/T$
Z_{thjc} $(\frac{K}{W})$
D=
0.5
0.2
0.1
0.05
0.02
0.01
0
10^{0}
10^{-1}
10^{-2}
5
10^{-5}
10^{-4}
10^{-3}
10^{-2}
10^{-1}
10^{0}
(S)
t
$D = \frac{t}{T}$
T

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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