G

SANSHA ELECTRIC MFG.CO.,LTD.

SiC MOSFET Module SPECIFICATION

1. PART NUMBER

FCA100AC120

2. DEVICE TYPE

Isolated module

3. RATINGS AND CHARACTERISTICS

100A
1200V
See spec sheet and graphs attached.

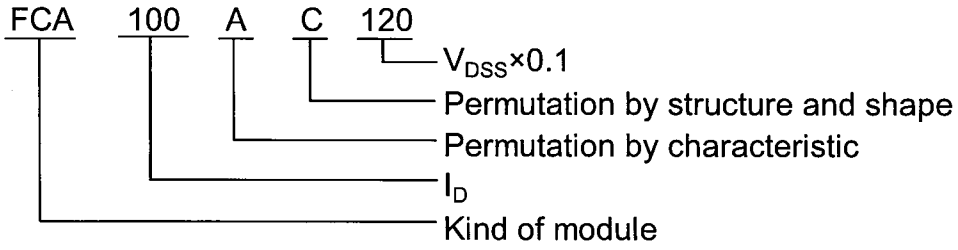
4. OUTLINE DRAWING

See Drawing No.G00A0197600

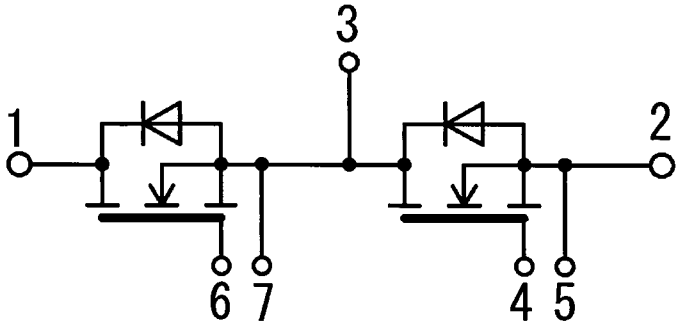
5. TEST PER PERFORMED BY

JEITA ED-4561B

6. DEFINITION OF PART NUMBER



7. CIRCUIT DIAGRAM



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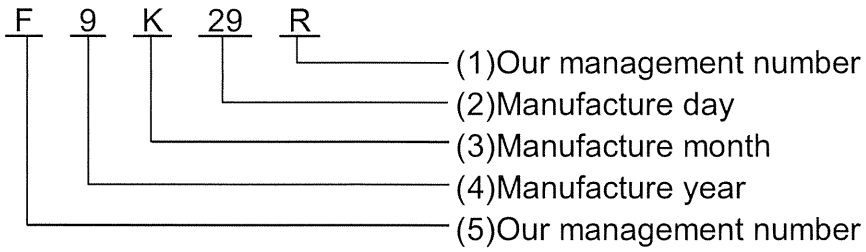
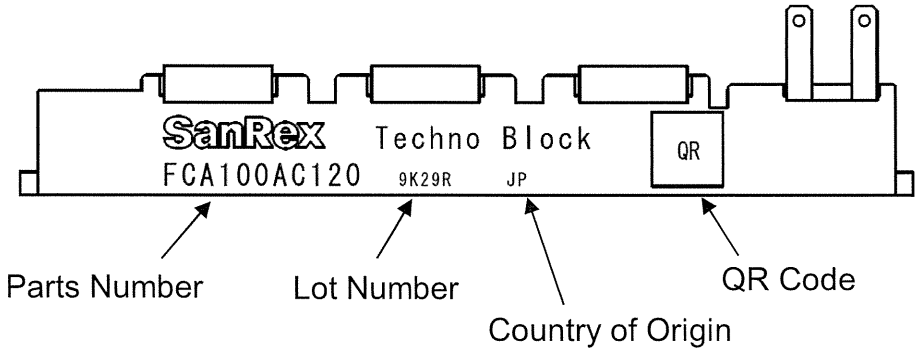
8. DEFINITION OF LOT NUMBER

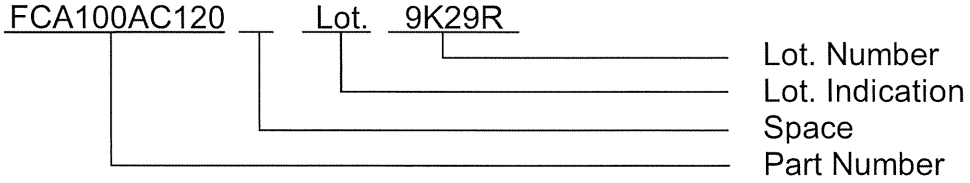


(1) Our management number.
Note "R" indicate RoHS-compliant products.
(2) Manufacture day.
"01-31" : From 1th to 31th.
Example "29" : 29th.
(3) Manufacture month.
"A - L" : From January to December.
Example "K" : November
(4) Manufacture year.
The number of the end of A.D.
Example "9" : 2019 years.
(5) Our management number.
Some cases have no entry at all.

9. PRODUCT PRINTING SPECIFICATIONS



QR-CODE INFORMATION



10. STANDARD

UL1557
RoHS Compliant

FCA100AC120

■ Maximum Ratings (Tj=25℃ unless otherwise specified)

Item	Symbol	Unit	Ratings	Conditions
Drain-Source Voltage	V_{DSS}	V	1200	
Gate-Source Voltage(+)	V_{GSS}	V	22	
Gate-Source Voltage(-)		V	-7	
Drain Current	I_D	A	100	V_{GS}=20V, Tc=90℃, DC
	$I_{D(pulse)}$	A	300	Pulse
Source Current	I_S	A	100	V_{GS}=-5V, Tc=90℃, DC
	$I_{S(pulse)}$	A	300	Pulse
Total Power Dissipation	P_{tot}	W	625	T_C=25℃
Operating Junction Temperature	T_j	℃	-40～+150	
Storage Temperature	T_{stg}	℃	-40～+125	
Isolation Voltage	V_{iso}	V	2500	AC, RMS, 1min

■ Electrical Characteristics (Tj=25℃ unless otherwise specified)

Item	Symbol	Unit	Ratings			Conditions
			Min.	Typ.	Max.	
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V	1200			V_{GS}=0V, I_D=200μA
Static Drain-Source On-State Voltage	$V_{DS(on)}$	V		0.68	1.40	V_{GS}=20V, I_D=100A
				0.74	1.50	V_{GS}=20V, I_D=100A, T_j=150℃
On-State Resistance	$R_{DS(on)}$	mΩ		6.8	14.0	V_{GS}=20V, I_D=100A
				7.4	15.0	V_{GS}=20V, I_D=100A,T_j=150℃
Drain Cutoff Current	I_{DSS}	μA			200	V_{DS}=1200V, V_{GS}=0V
Gate-Source Threshold Voltage	$V_{GS(th)}$	V	3	4	5	V_{DS}=10V, I_D=3mA
Gate-Source Leakage Current	I_{GSS}	nA			200	V_{GS}=20V, V_{DS}=0V
Switching Characteristics	$t_{d(on)}$	ns		58		I_D=100A, V_{DS}=600V, V_{GS}=+20V/-5V, R_G=3.3Ω, L=126μH
	t_r	ns		33		
	t_{rr}	ns		47		
	$t_{d(off)}$	ns		121		
	t_f	ns		49		
Total Gate Charge	Q_G	nC		660		I_D=100A, V_{DS}=600V, V_{GS}=+20V/-5V
Input Capacitance	C_{iss}	nF		17.2		V_{DS}=20V, V_{GS}=0V, f=100kHz
Output Capacitance	C_{oss}	nF		5.0		
Reverse Transfer Capacitance	C_{rss}	nF		0.6		
Source-Drain Voltage	V_{SD}	V		2.60	2.90	V_{GS}=-5V, I_S=100A
				2.62	2.95	V_{GS}=-5V, I_S=100A, T_j=150℃
Total Capacitive Charge	Q_c	nC		2300		I_{SD}=100A, V_{DS}=600V, di_{SD}/dt=2400A/μs, V_{GS}=-5V
Internal Gate Resistance	$R_{G(int)}$	Ω		0.4		
Internal Stray Inductance	Ls	nH		20		Between terminals 1 and 2

■ Thermal Characteristics (Tj=25℃ unless otherwise specified)

Junction-to-Case Thermal Resistance	$R_{th(j-c)}$	℃/W			0.2	Per leg
Case-to-Heat sink Thermal Resistance	$R_{th(c-f)}$	℃/W		0.06		Per module Thermal conductivity = 9×10^{-3} W/cm・℃

■ Mechanical Characteristics (Tj=25℃ unless otherwise specified)

Weight	-	g		130		
Mounting Torque(M5)	-	N・m			2.7	Main terminals and mounting to heat sink Recommended value 1.5～2.5N・m

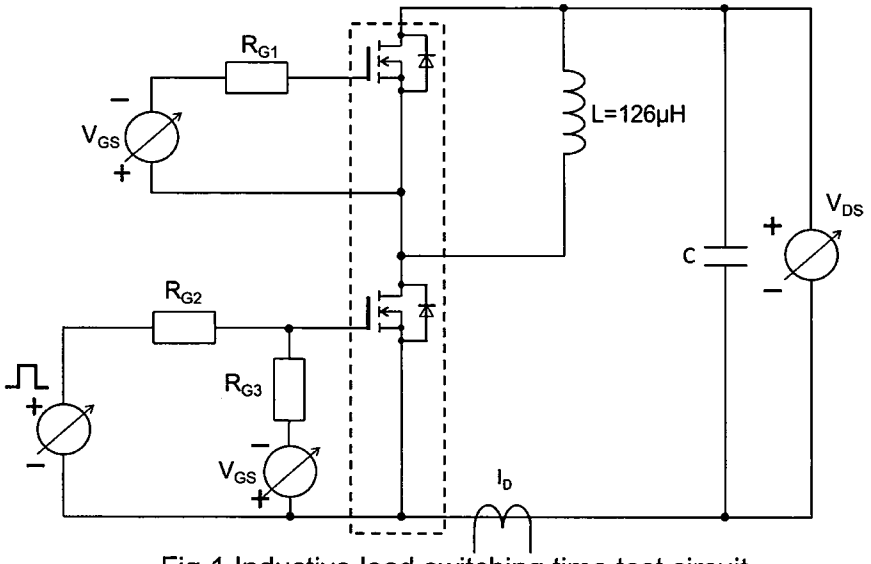


Fig.1 Inductive load switching time test circuit

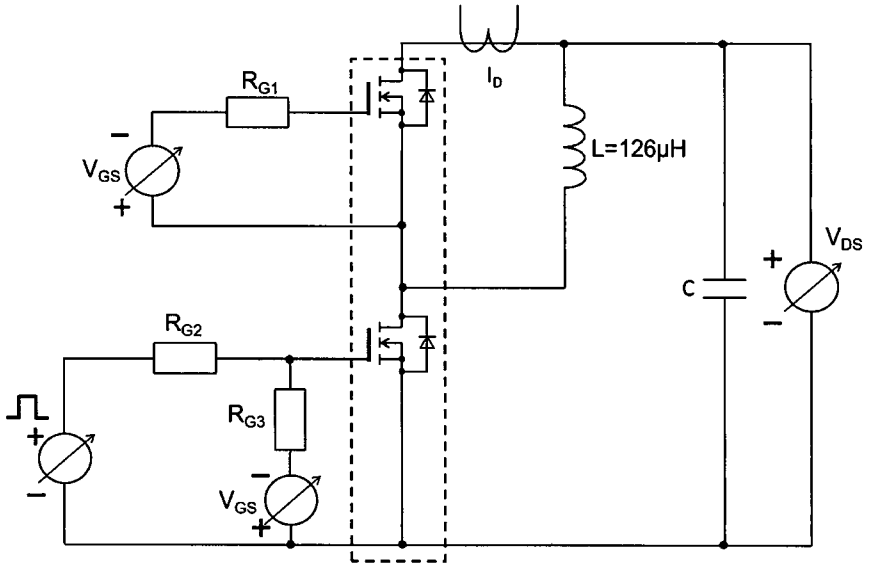


Fig.2 Inductive load recovery switching time test circuit

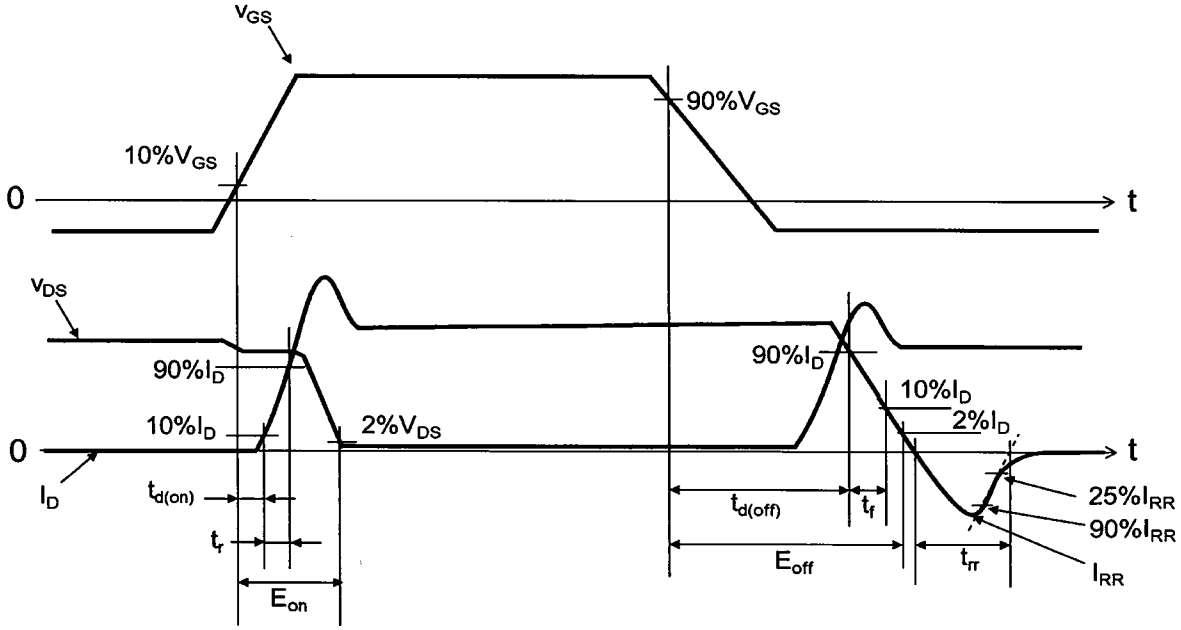


Fig.3 Switching waveform at the time of Inductive load

Fig.4 Output Characteristics (Typical)

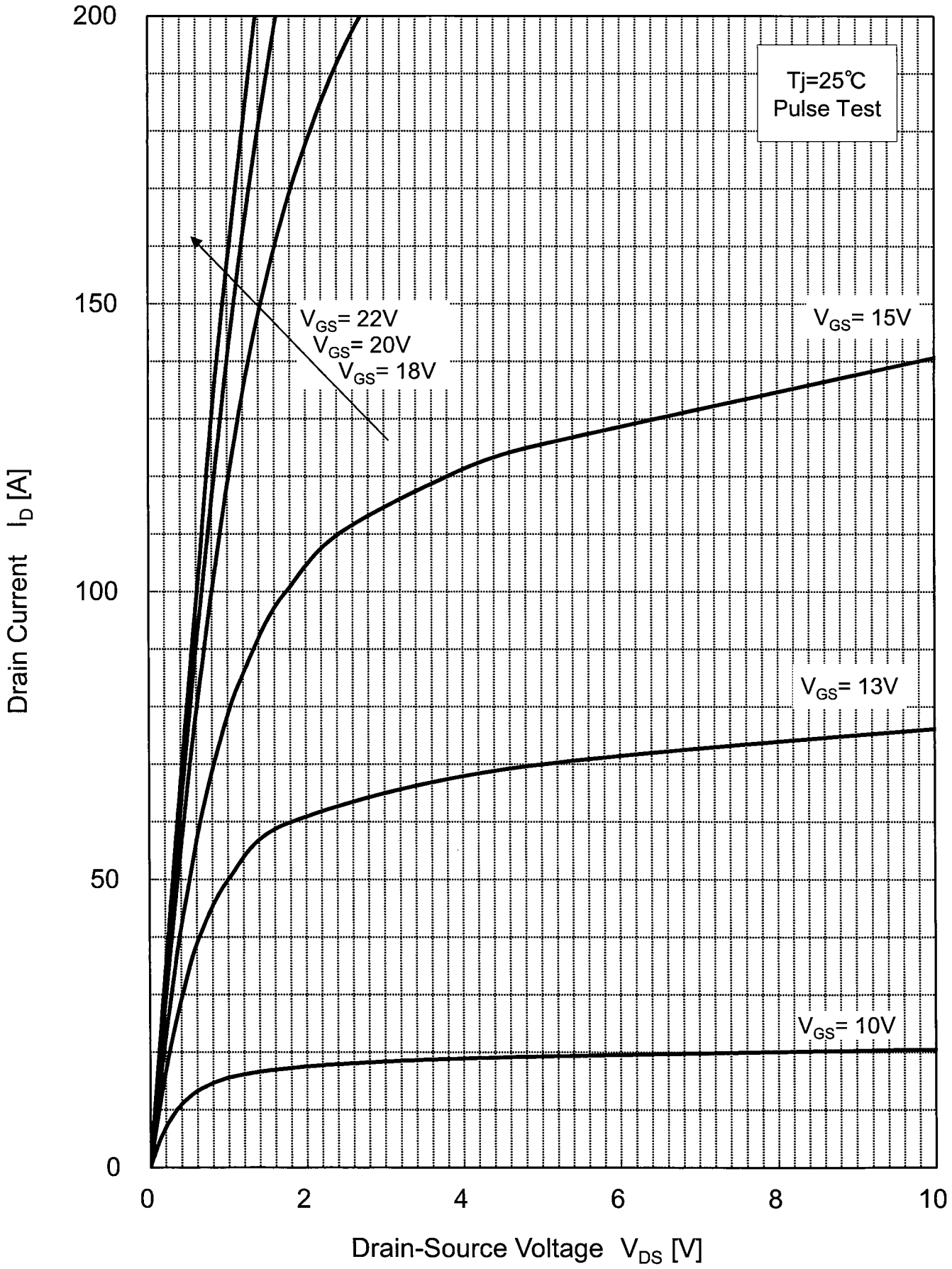


Fig.5 Output Characteristics (Typical)

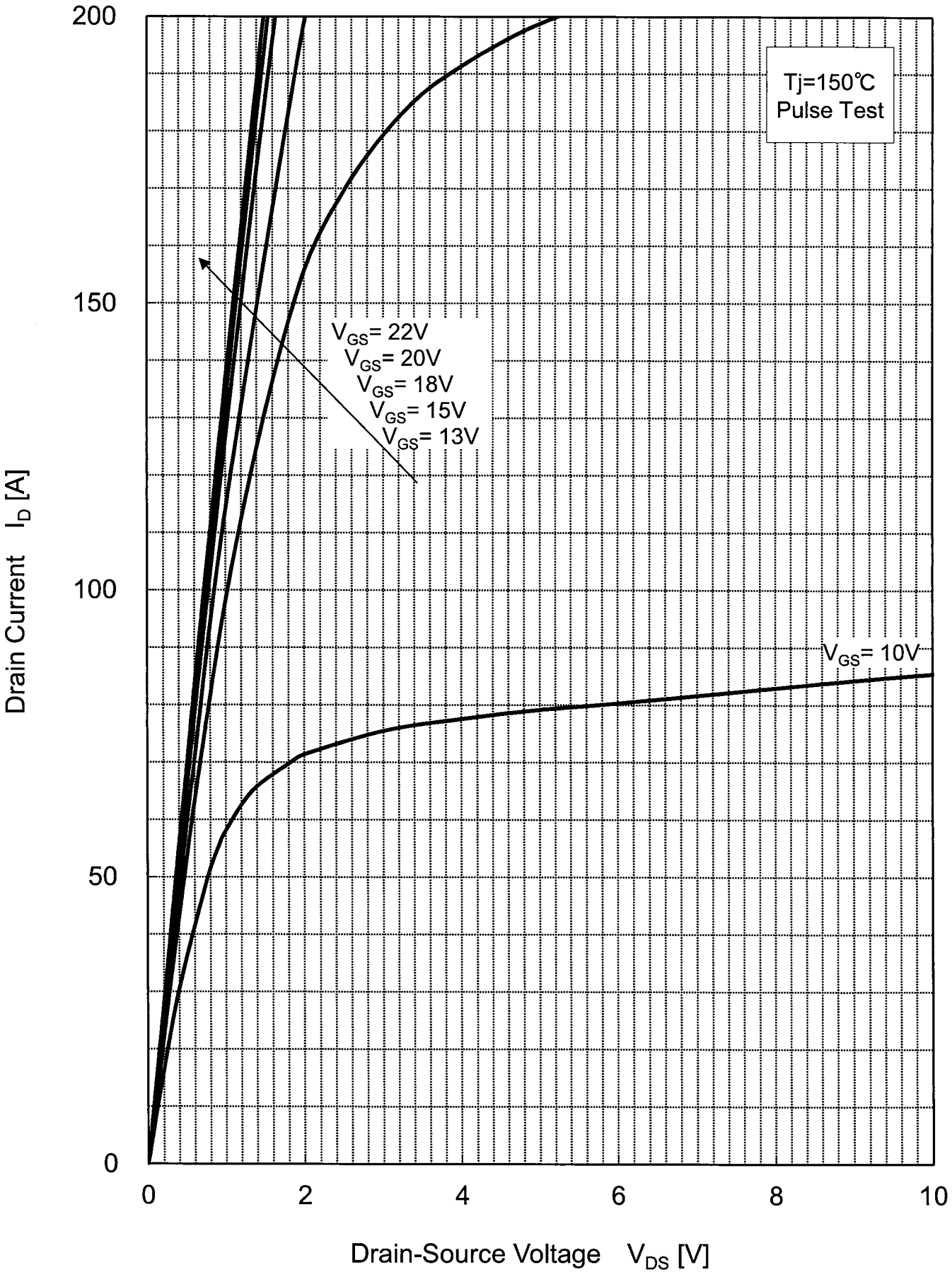


Fig.6 Transfer Characteristics (Typical)

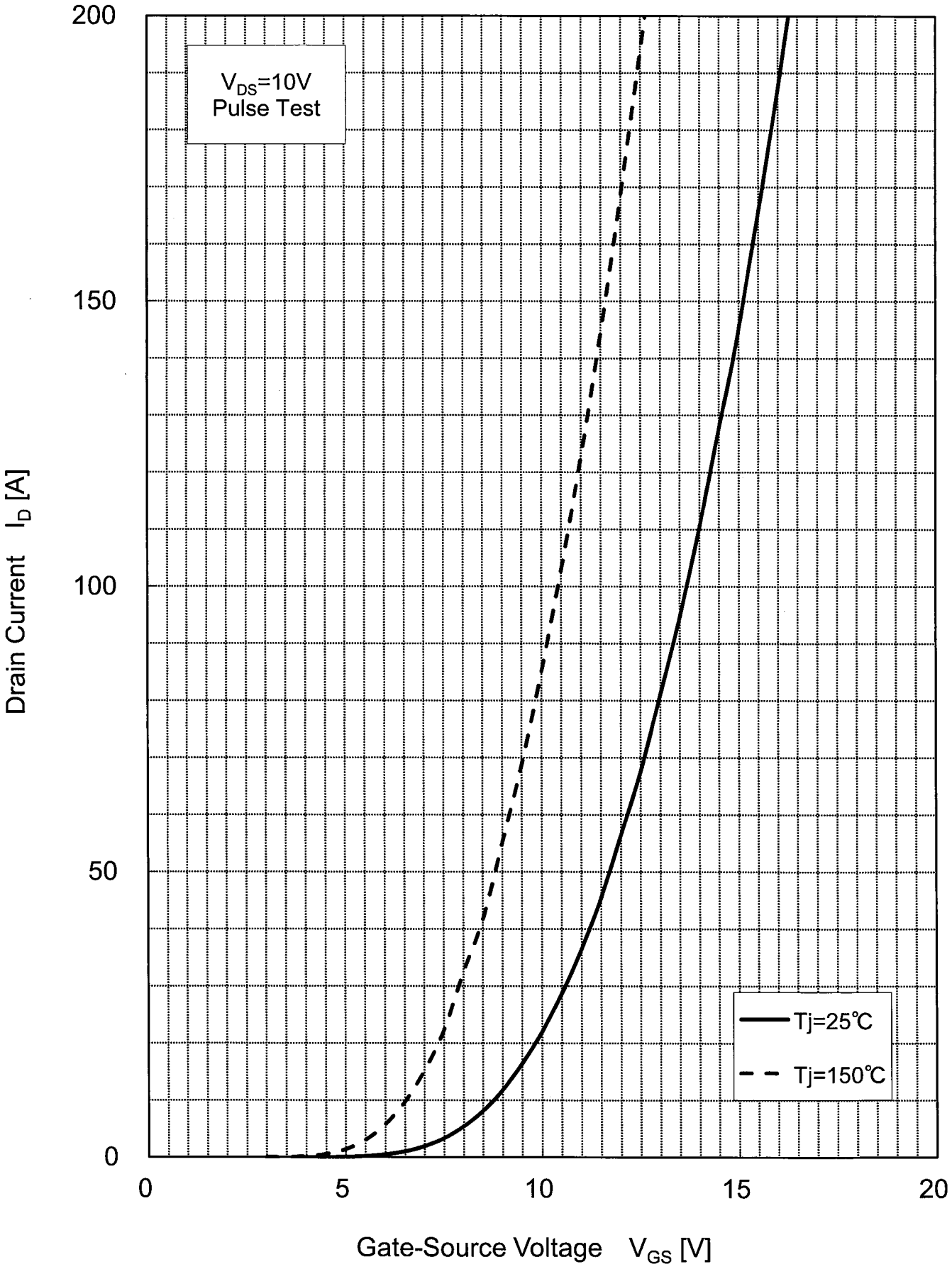


Fig.7 3rd Quadrant Characteristics (Typical)

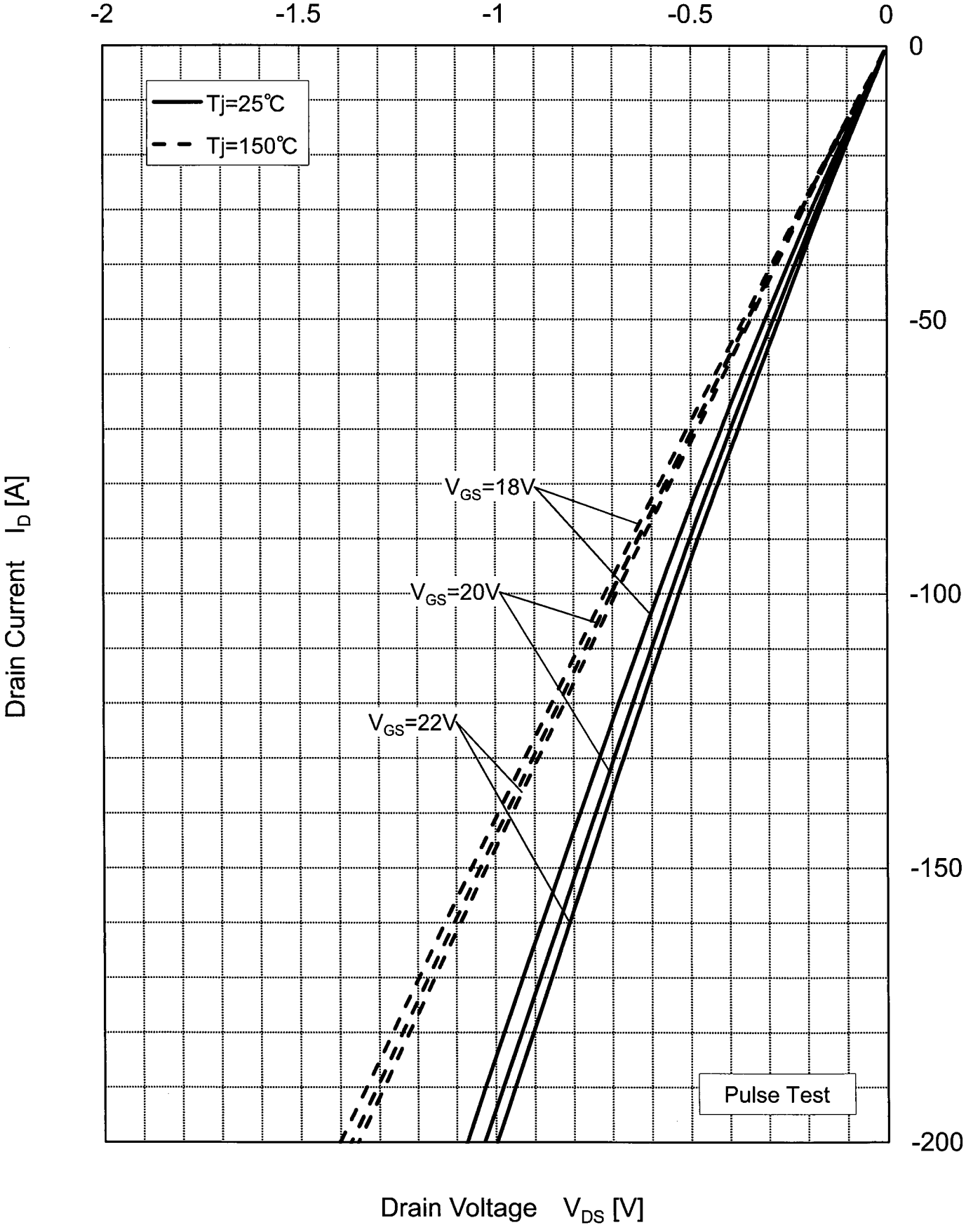


Fig.8 3rd Quadrant Characteristics (Typical)

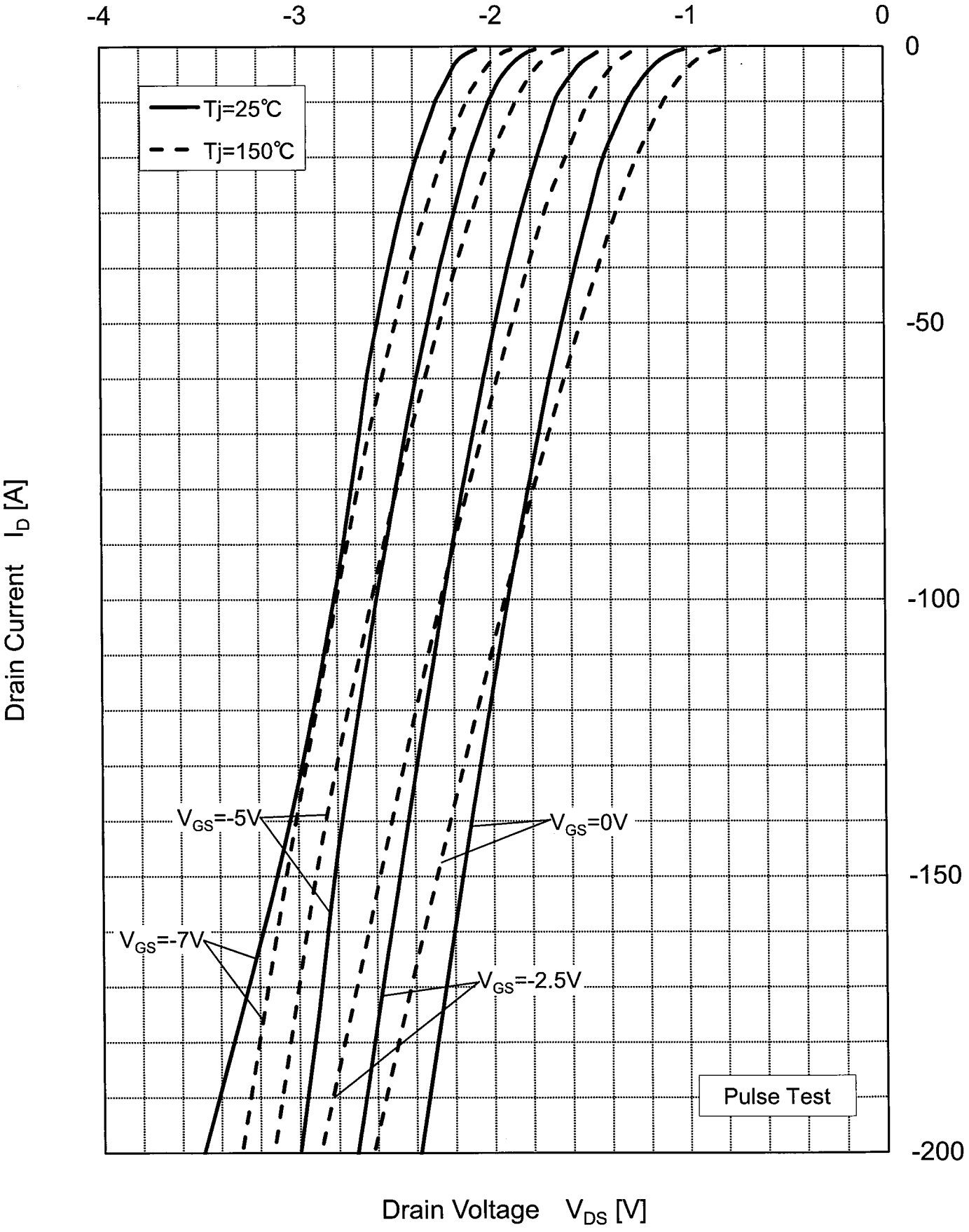


Fig.9 On-State Resistance vs Junction Temperature (Typical)

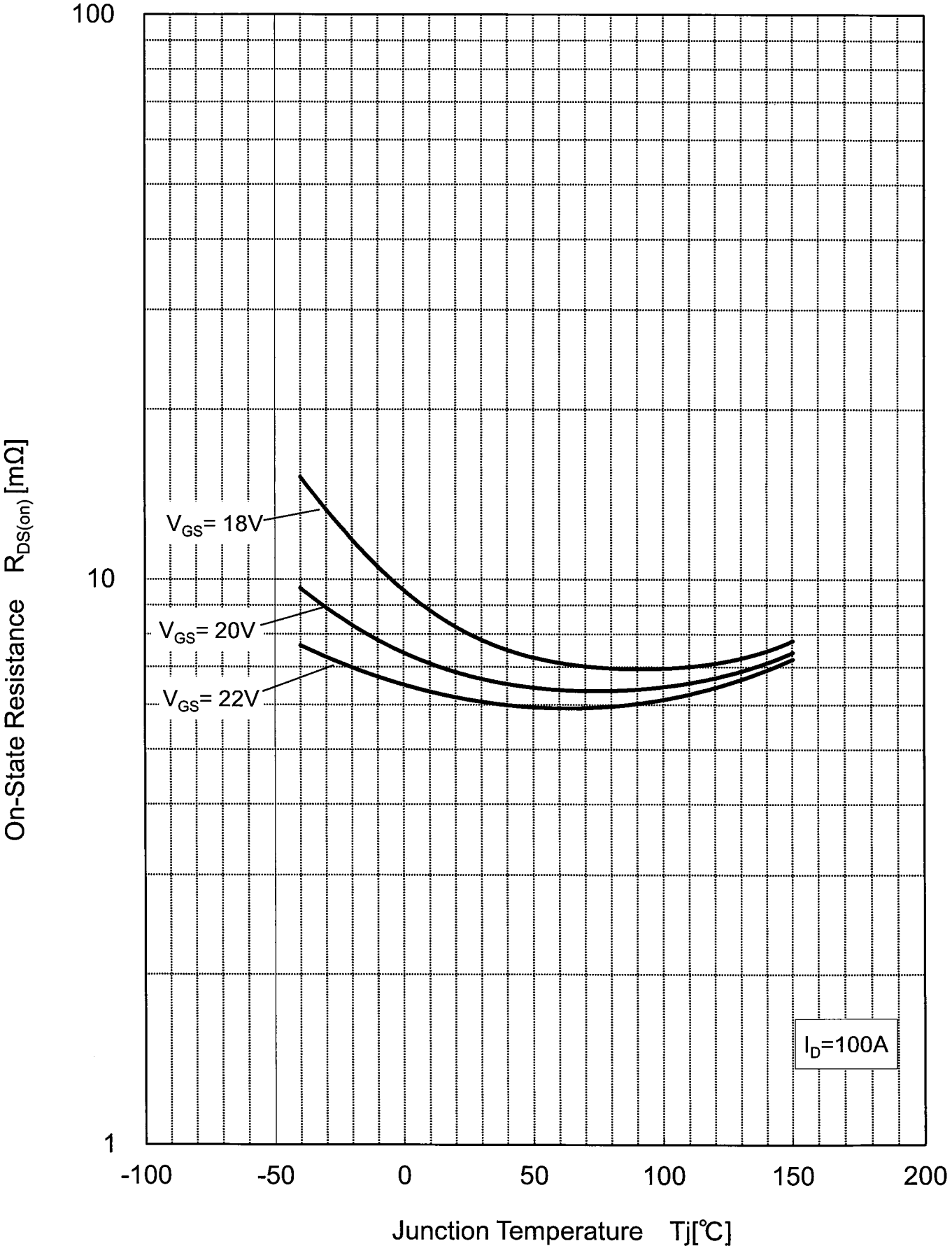


Fig.10 Source-Drain Voltage vs Junction Temperature (Typical)

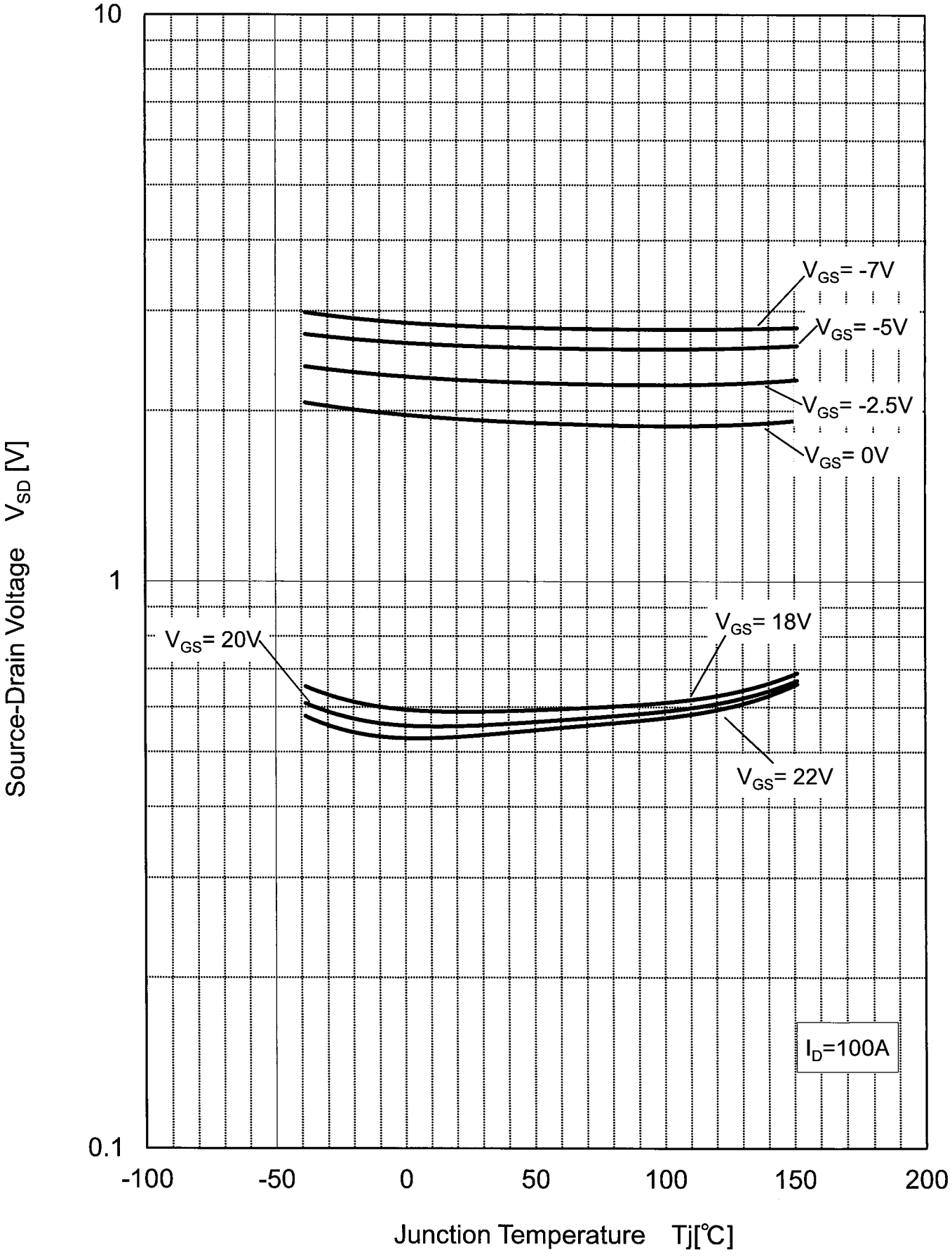


Fig.11 Capacitance (Typical)

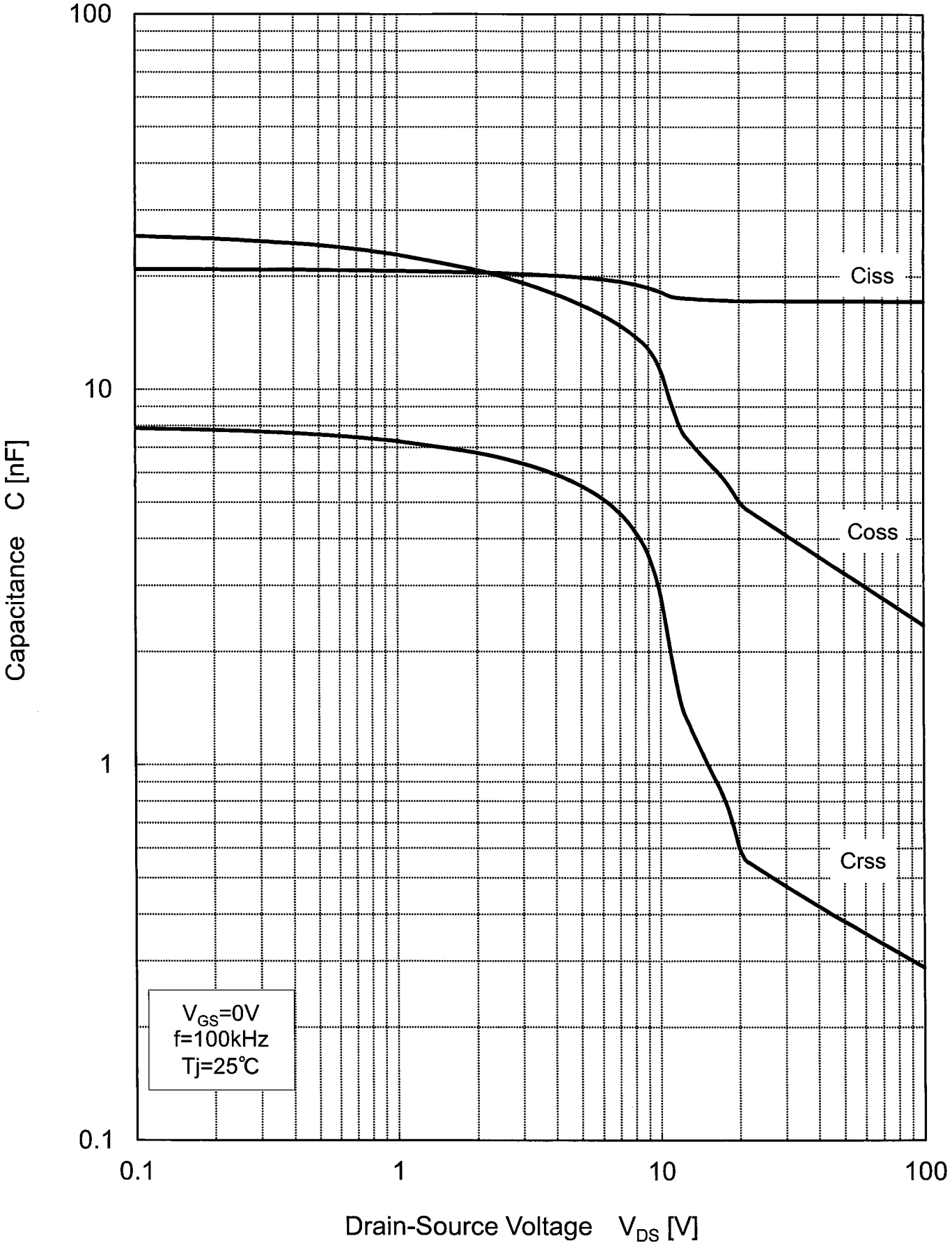


Fig.12 Gate Charge Characteristics (Typical)

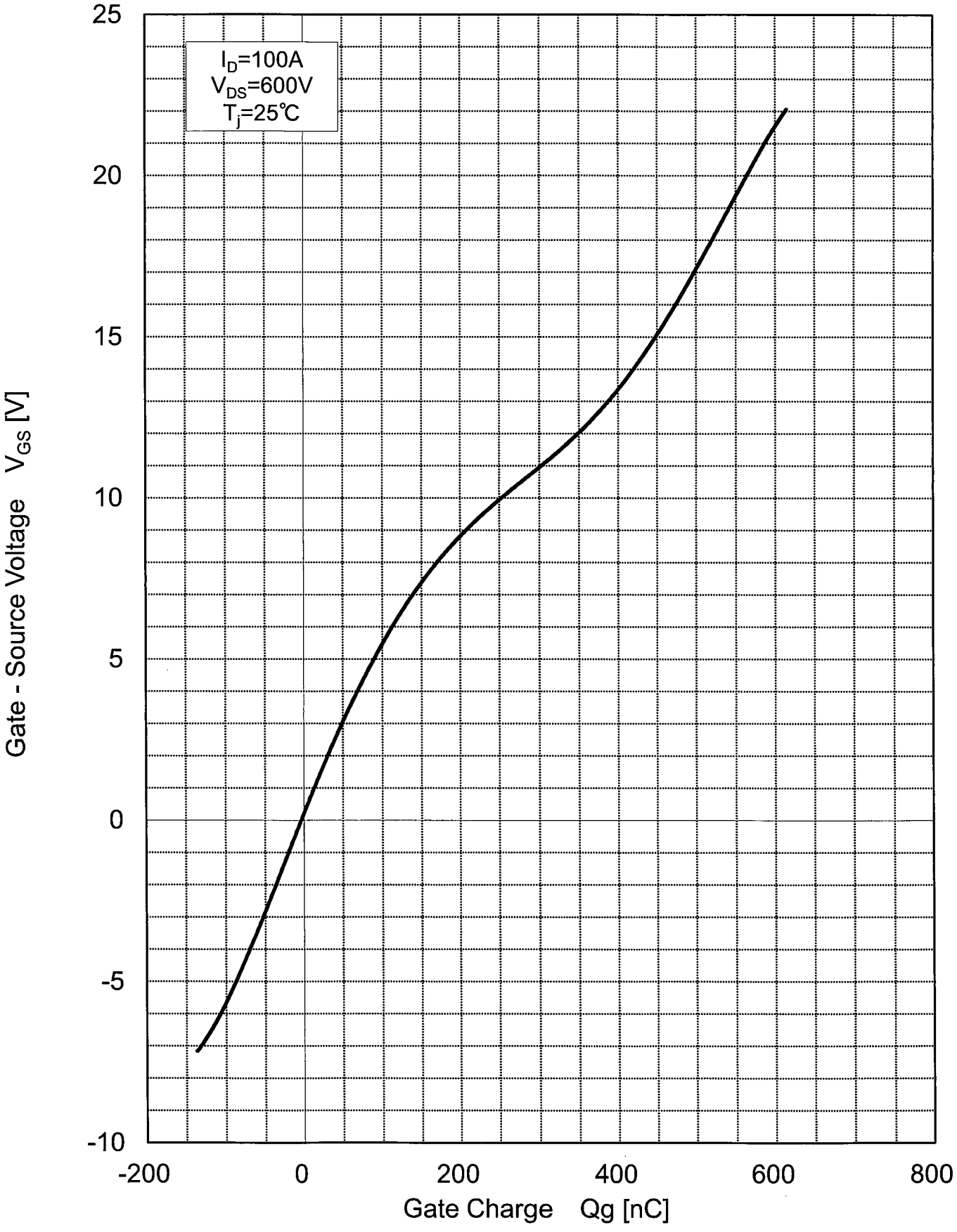


Fig.13 Switching Time vs Drain Current (Typical)

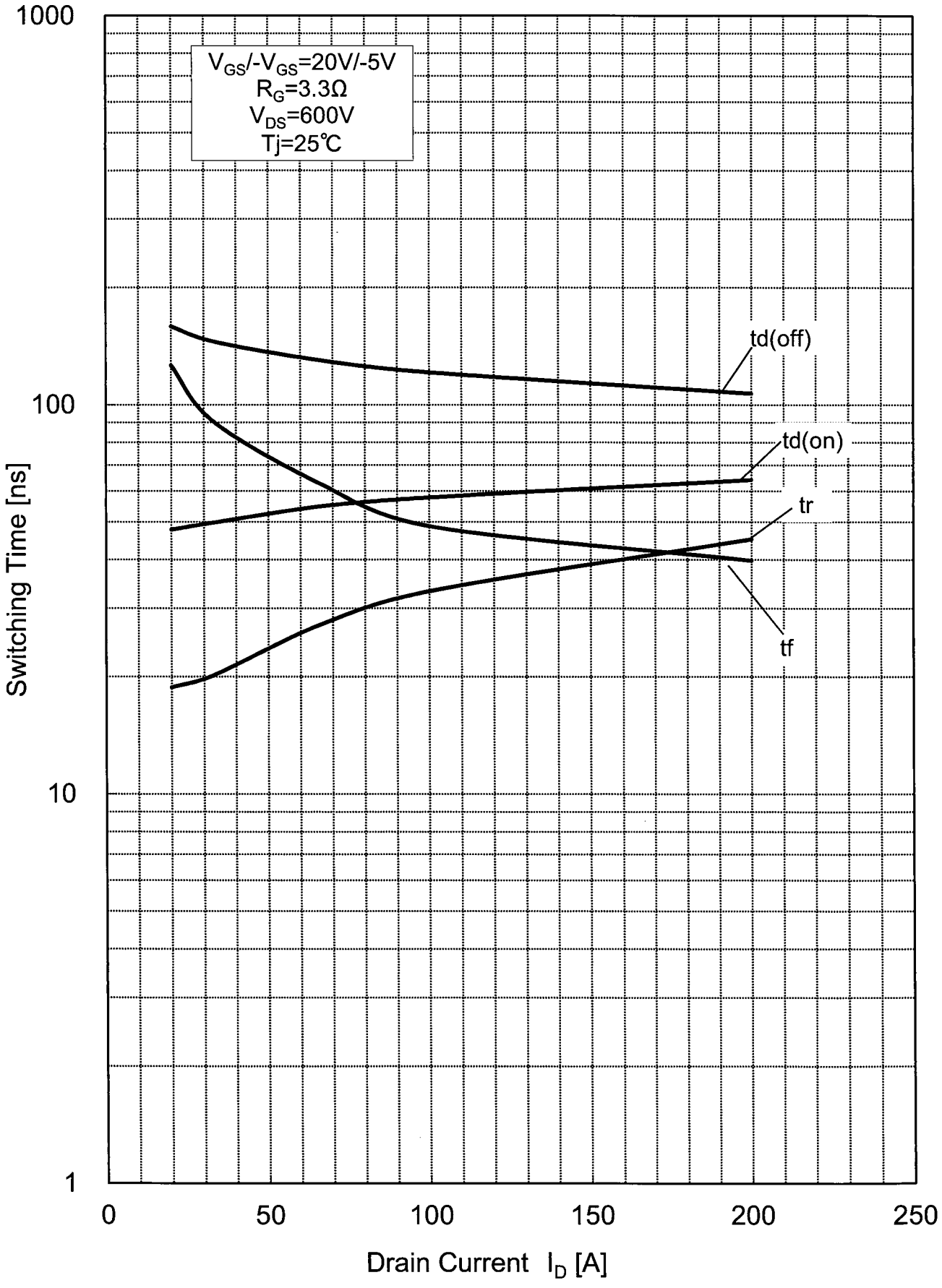


Fig.14 Switching Time vs Drain Current (Typical)

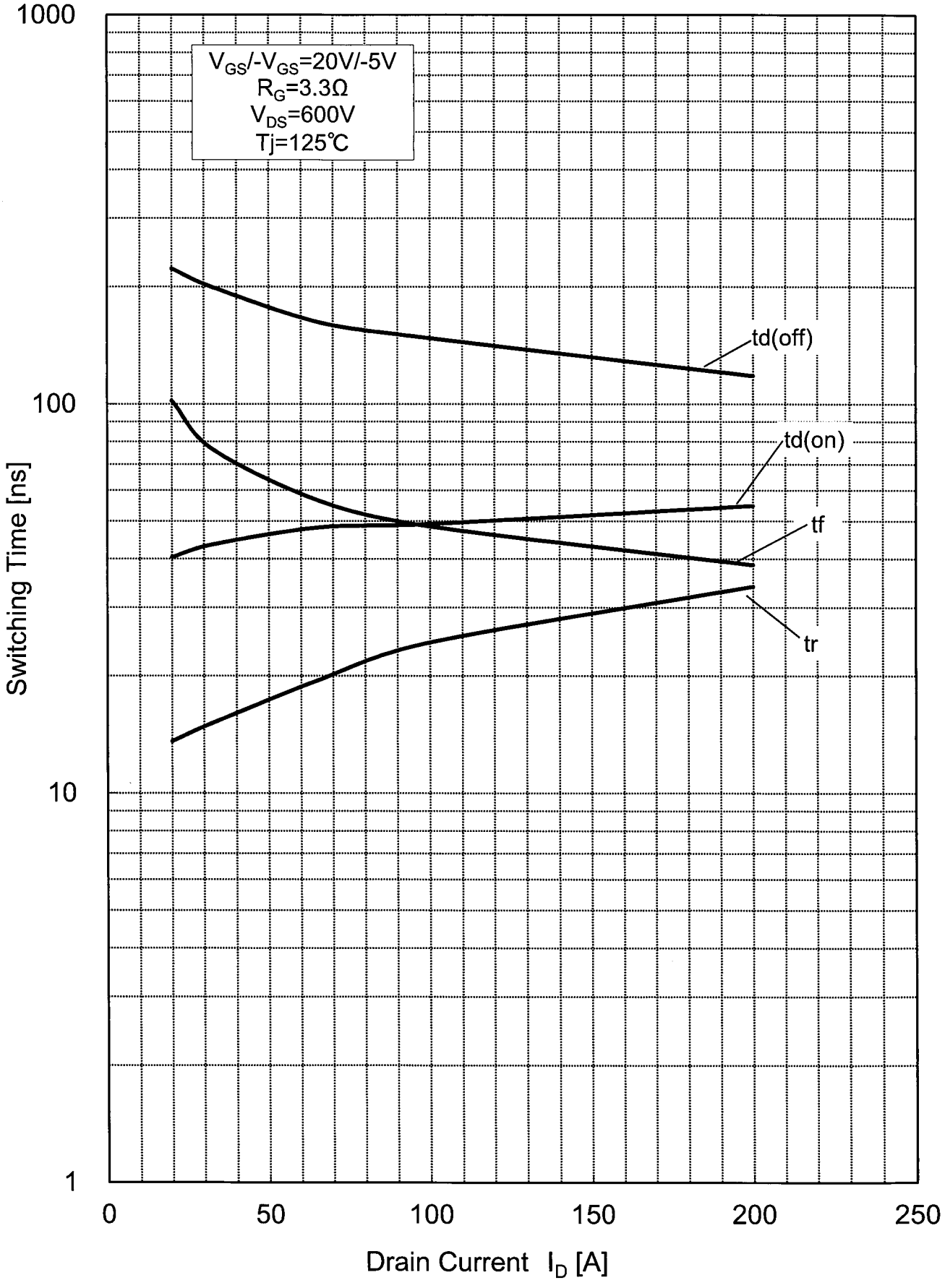


Fig.15 Switching Time vs Drain Current (Typical)

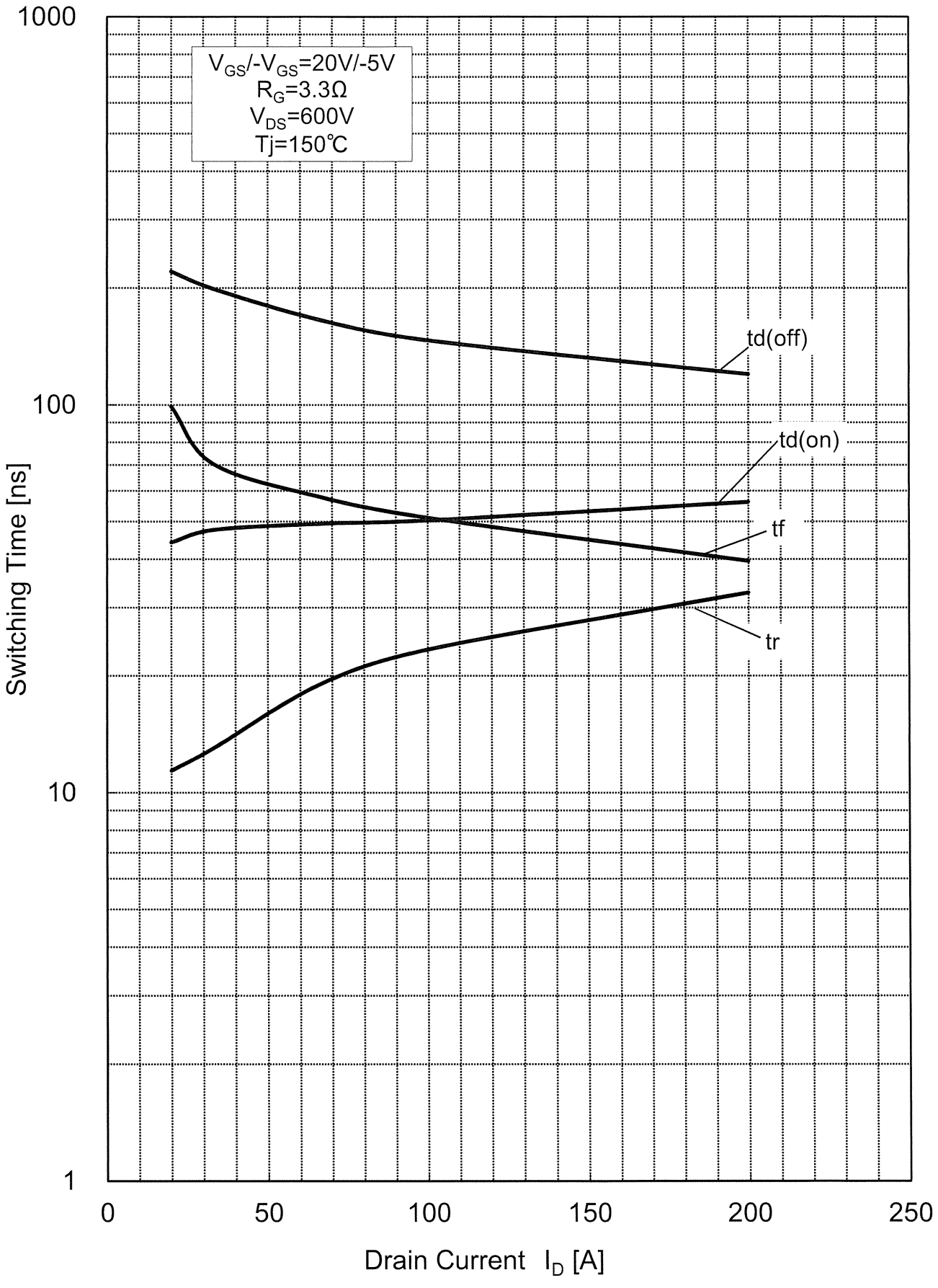


Fig.16 Switching Loss vs Drain Current (Typical)

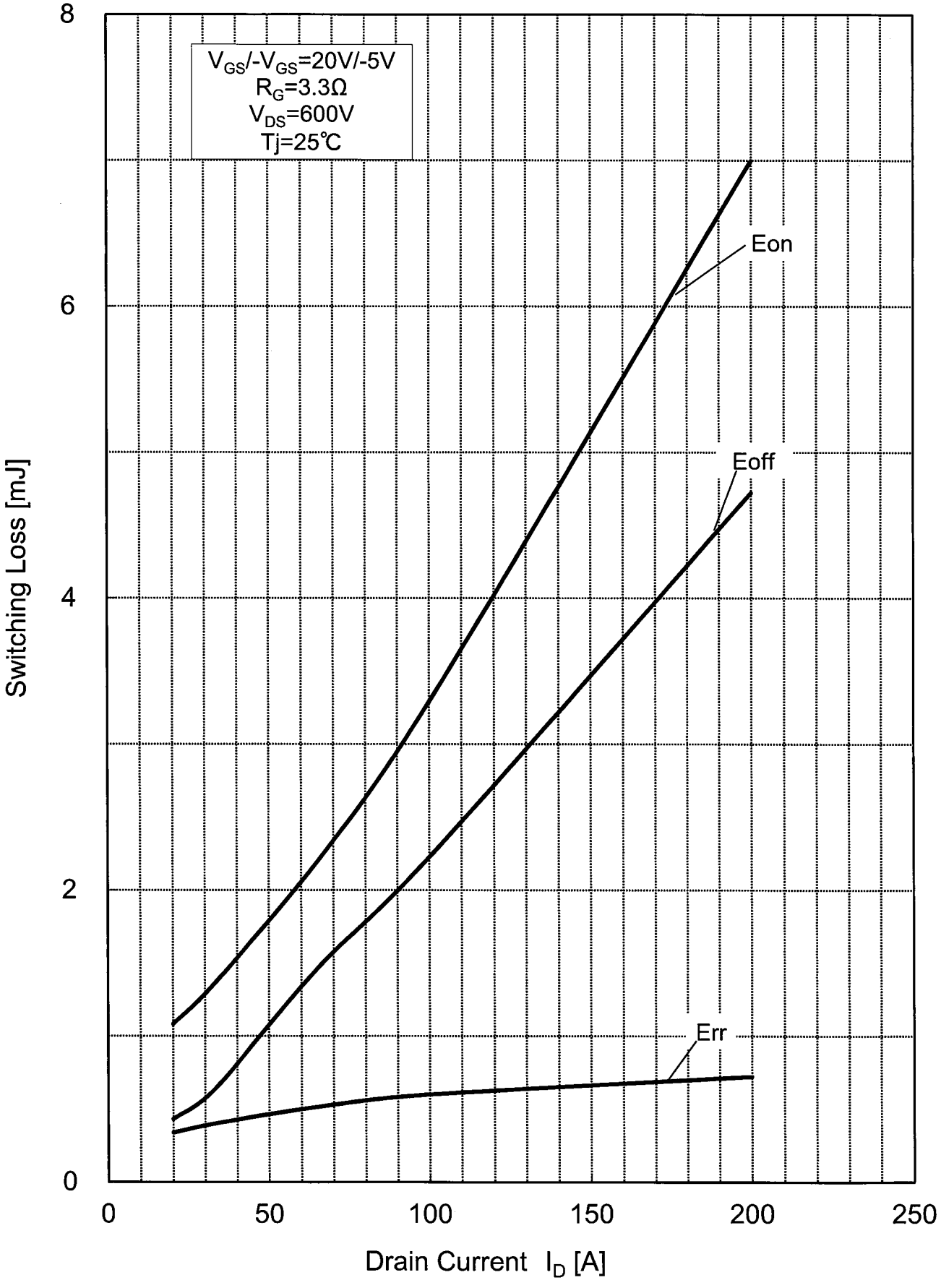


Fig.17 Switching Loss vs Drain Current (Typical)

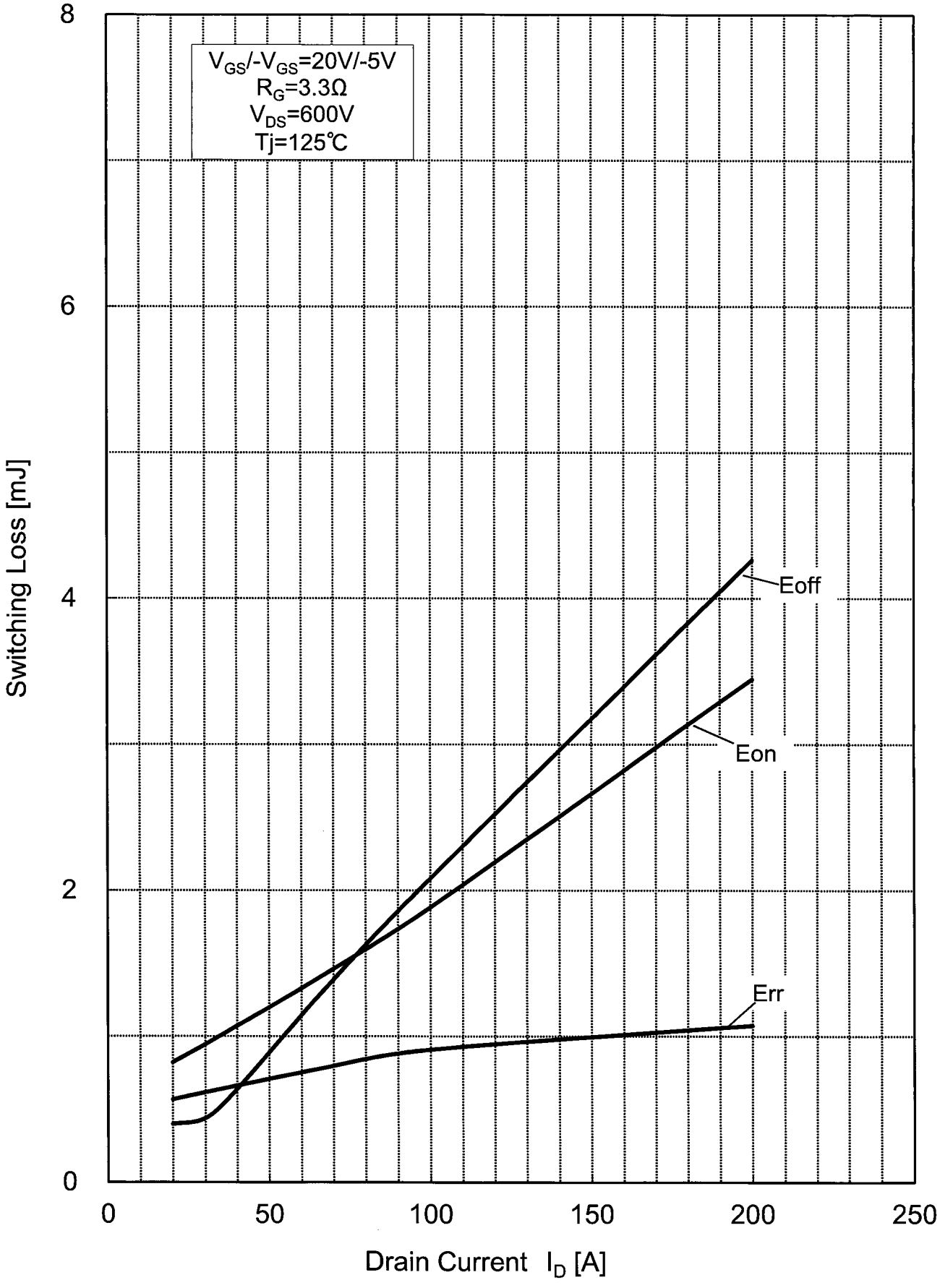


Fig.18 Switching Loss vs Drain Current (Typical)

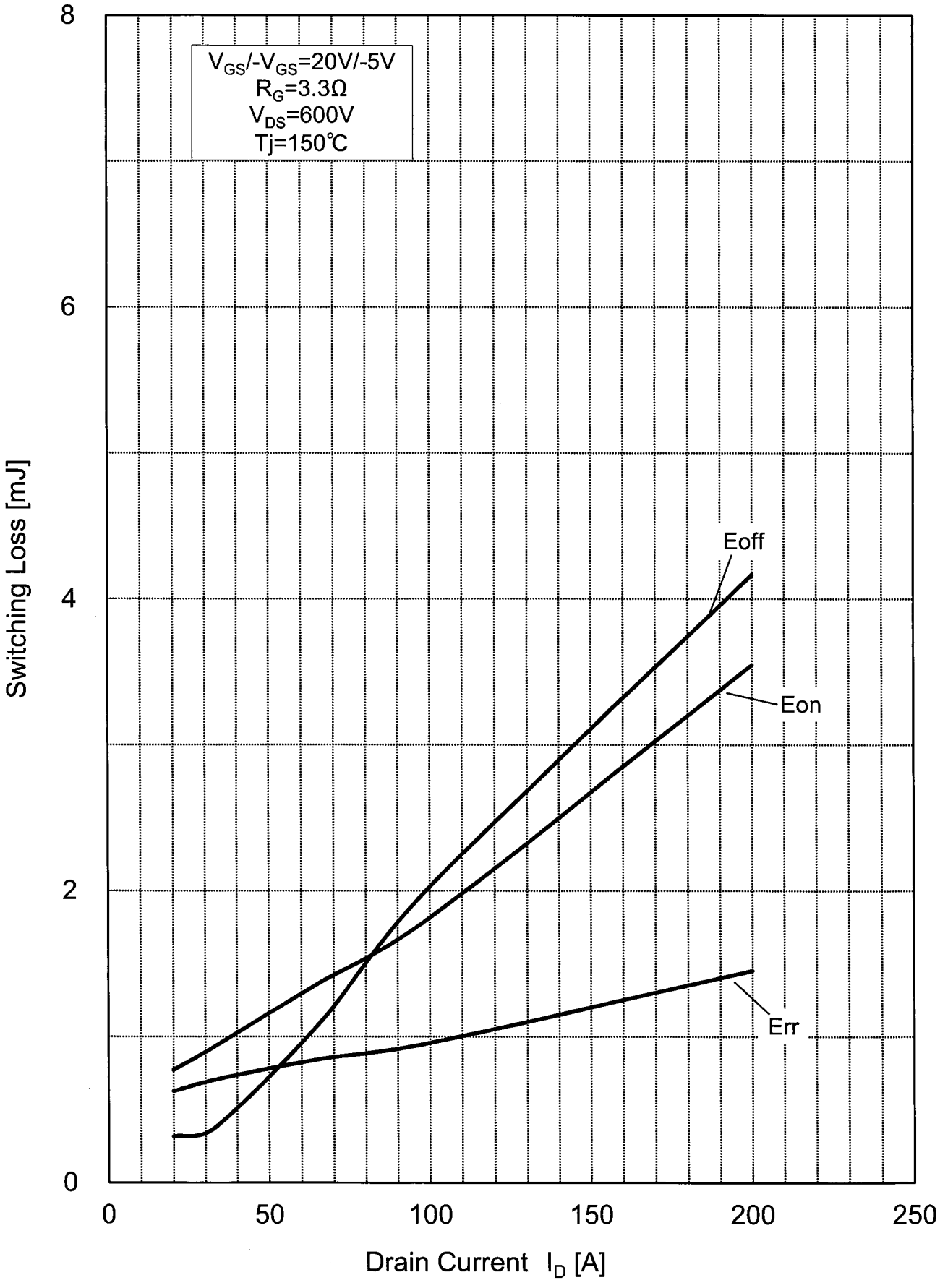


Fig.19 Switching Time vs Gate Resistance (Typical)

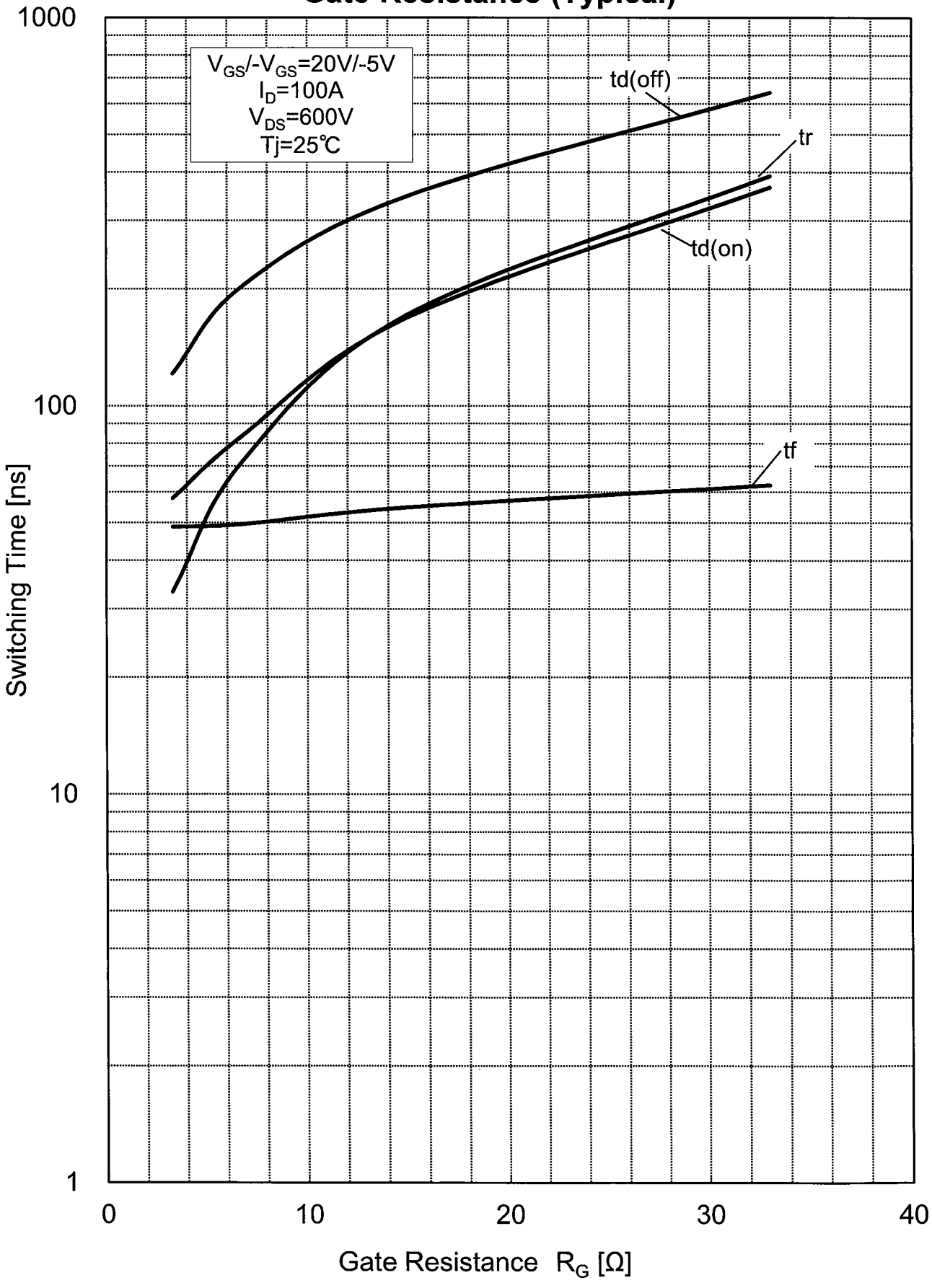


Fig.20 Switching Time vs Gate Resistance (Typical)

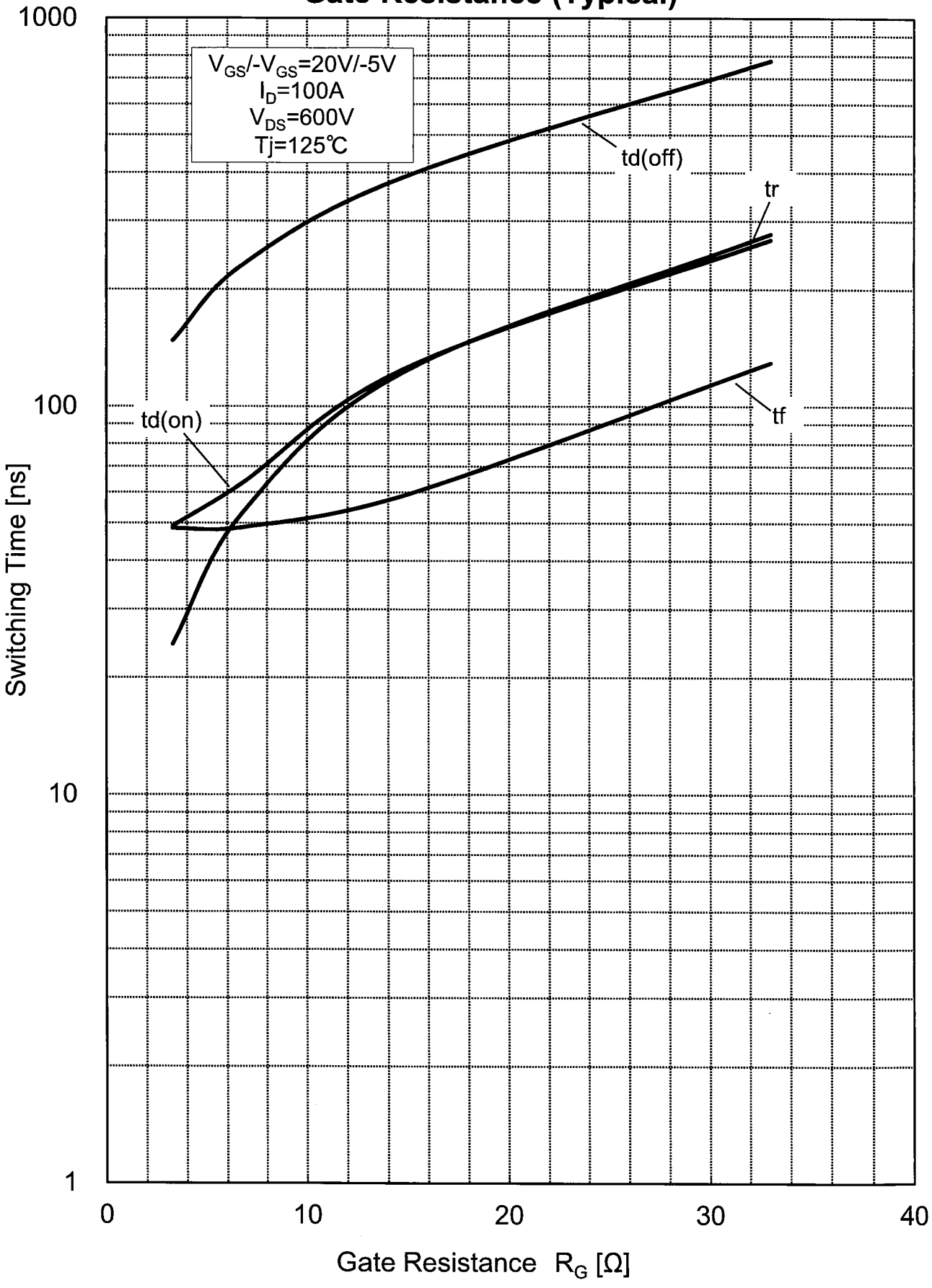


Fig.21 Switching Time vs Gate Resistance (Typical)

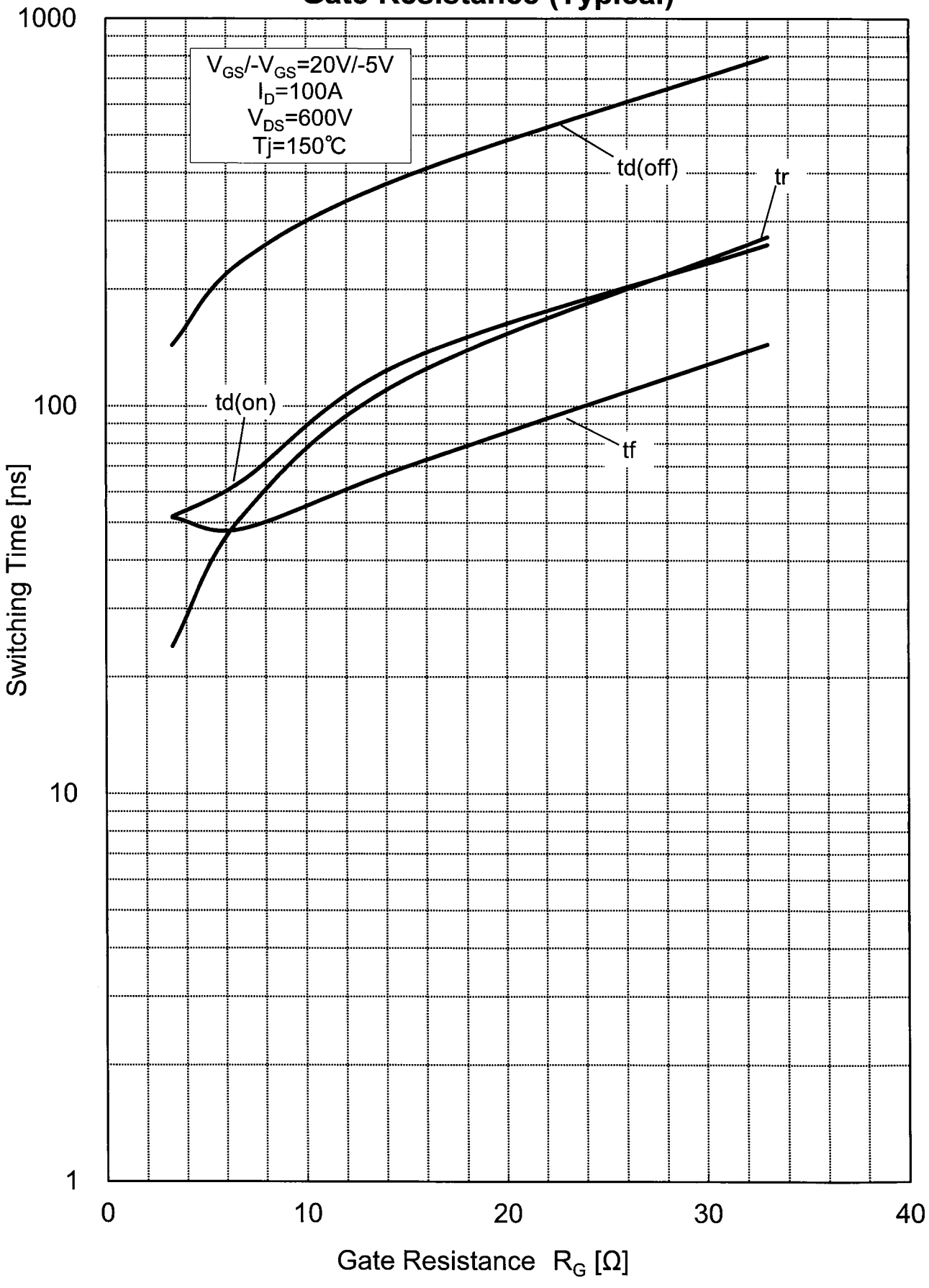


Fig.22 Switching Loss vs Gate Resistance (Typical)

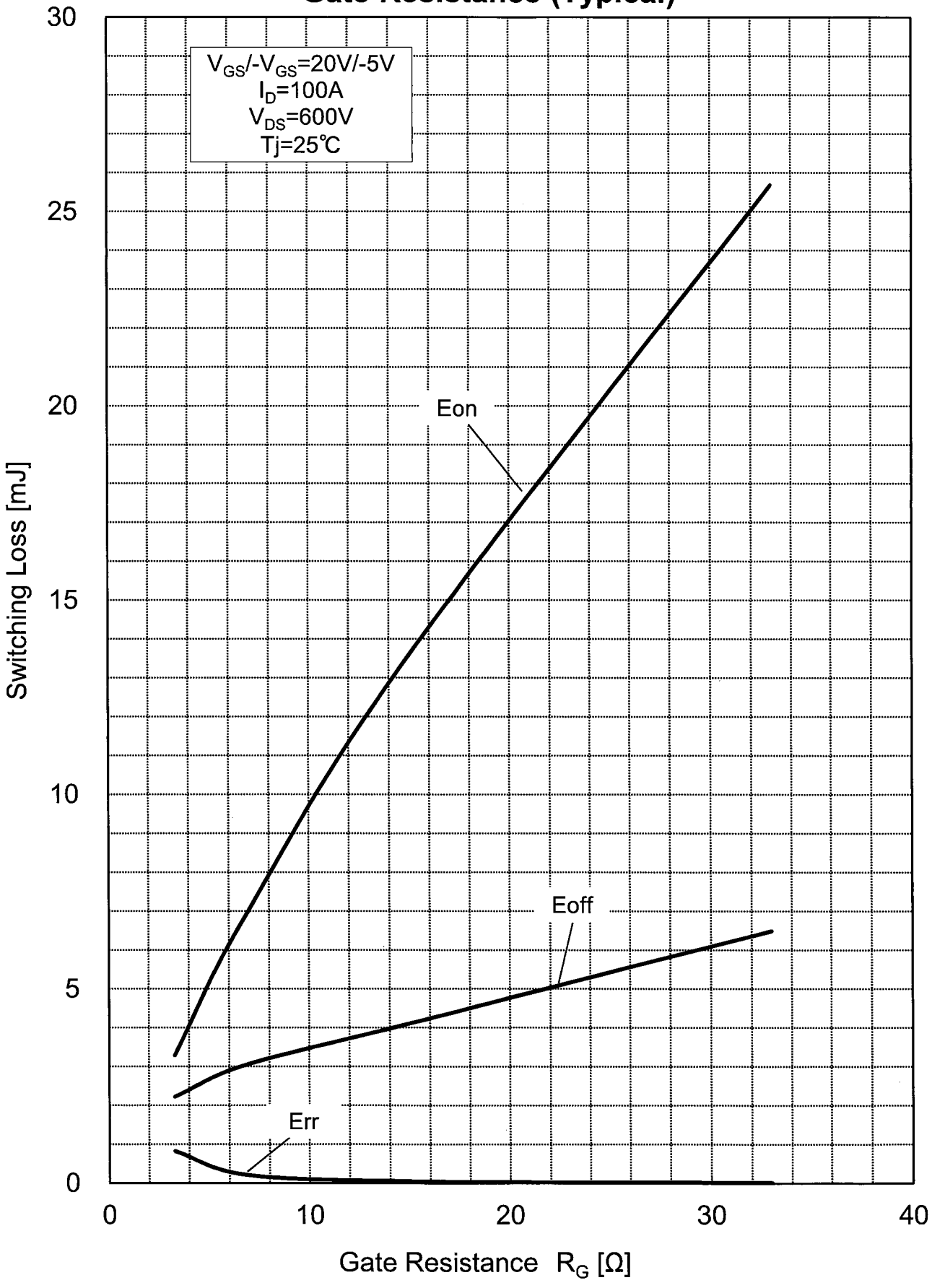


Fig.23 Switching Loss vs Gate Resistance (Typical)

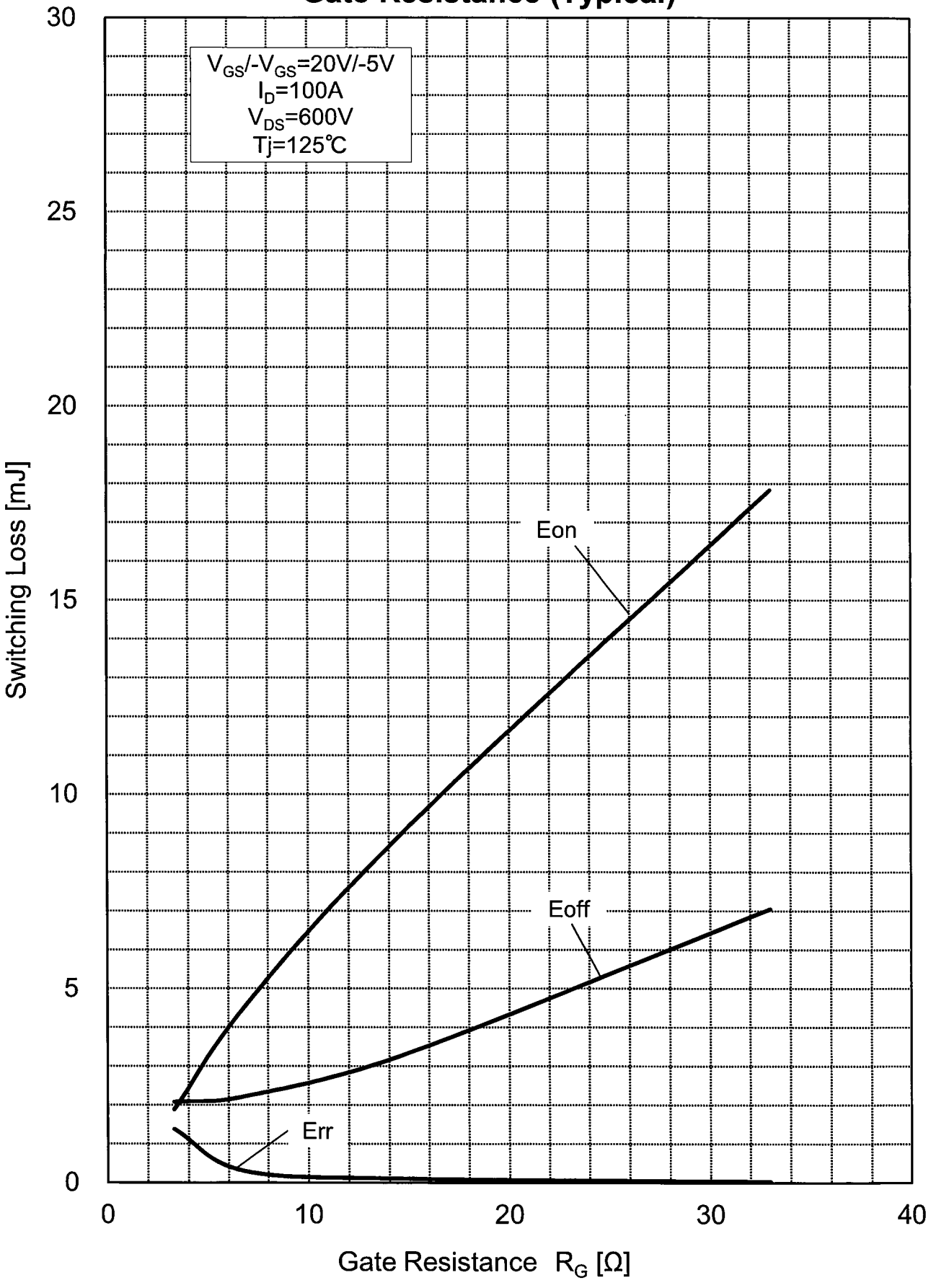


Fig.24 Switching Loss vs Gate Resistance (Typical)

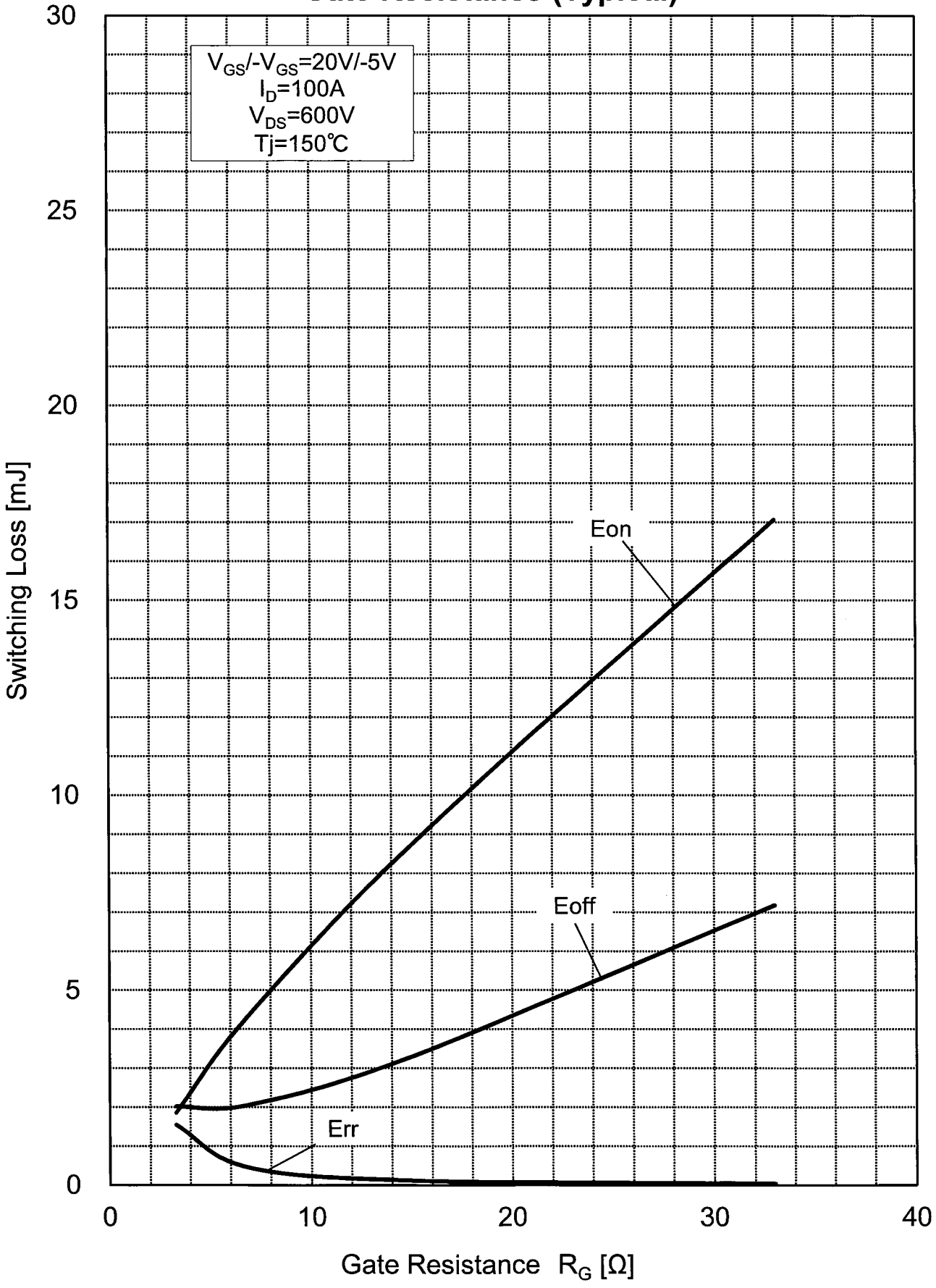


Fig.25 Recovery Characteristics vs Drain Current (Typical)

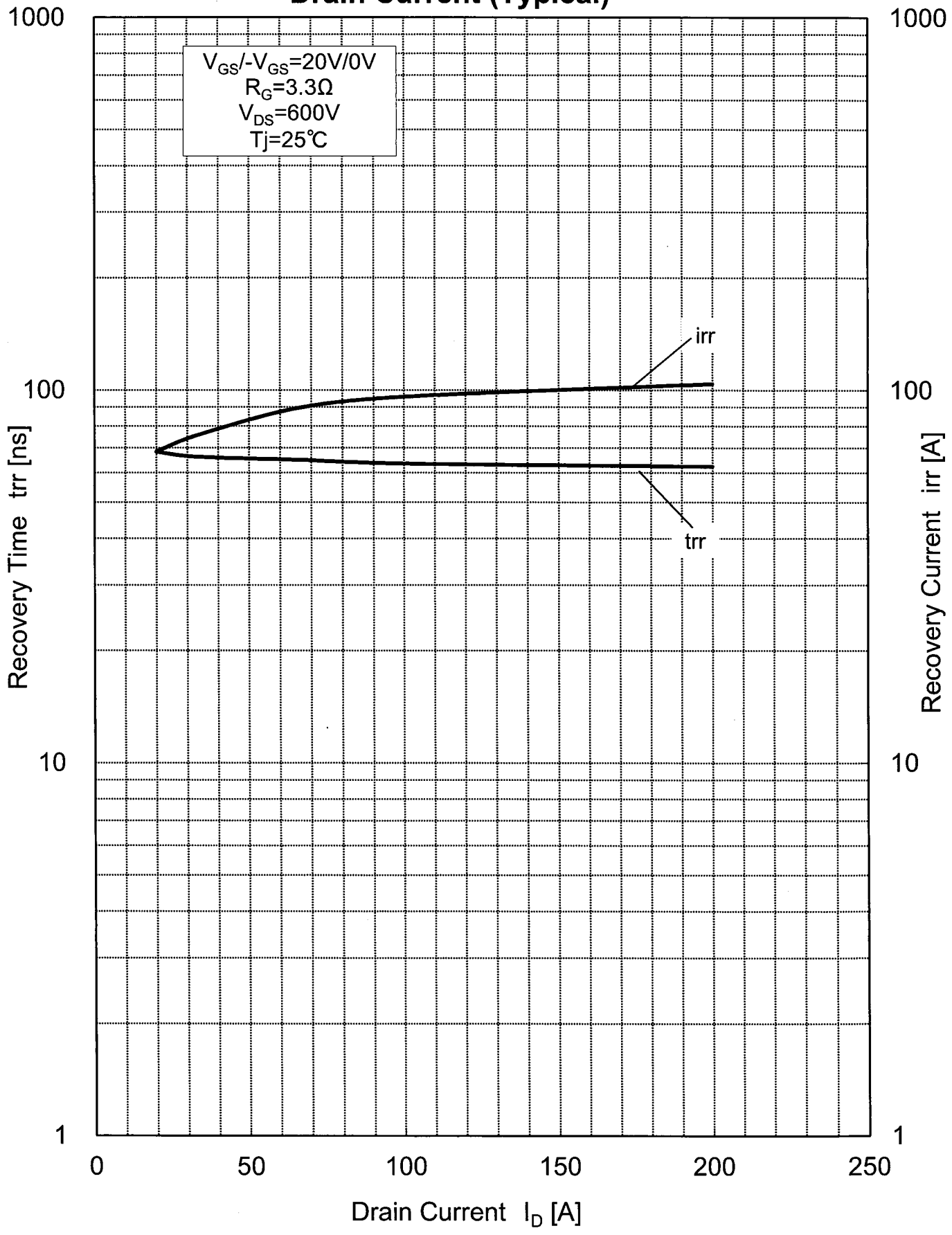


Fig.26 Recovery Characteristics vs Drain Current (Typical)

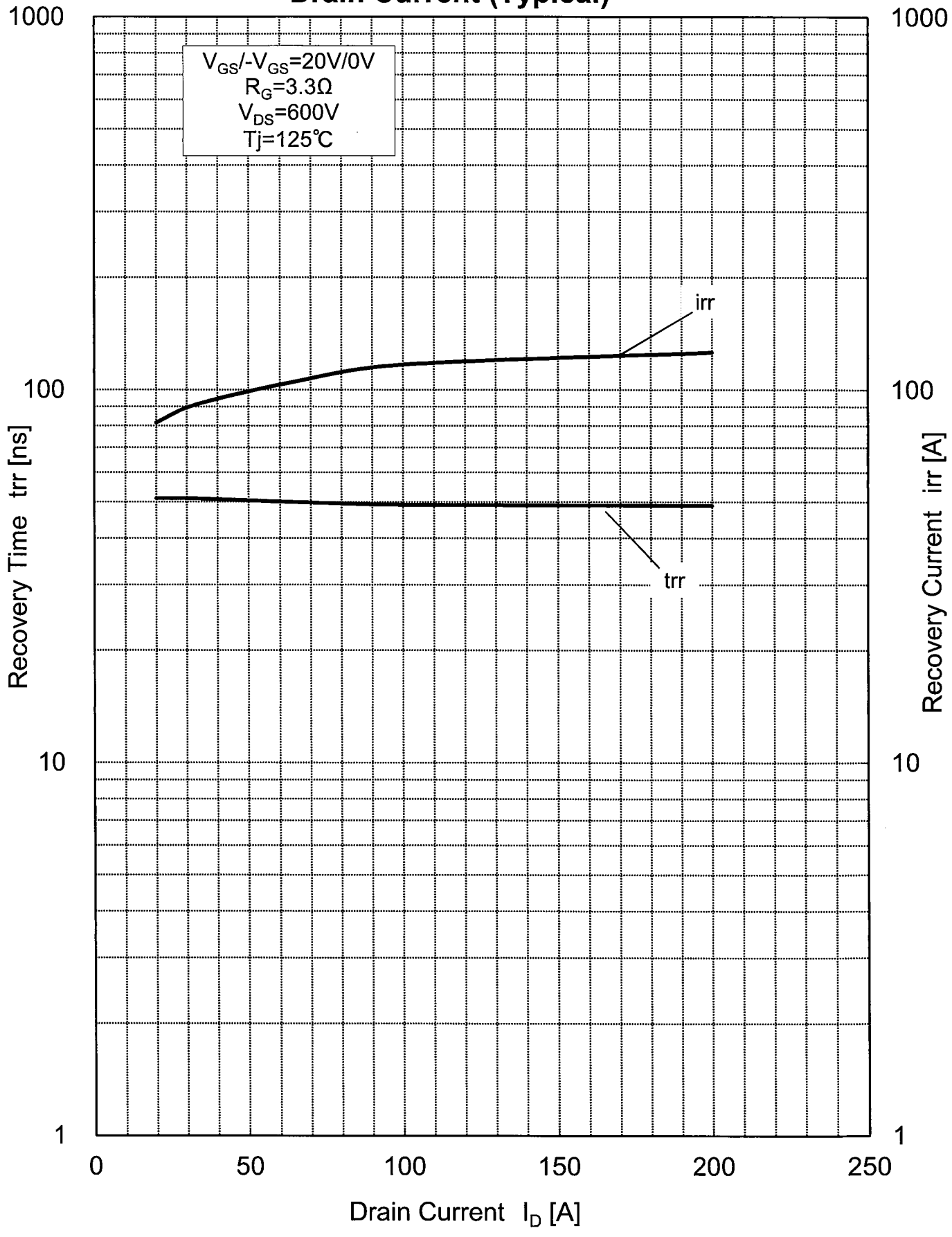


Fig.27 Recovery Characteristics vs Drain Current (Typical)

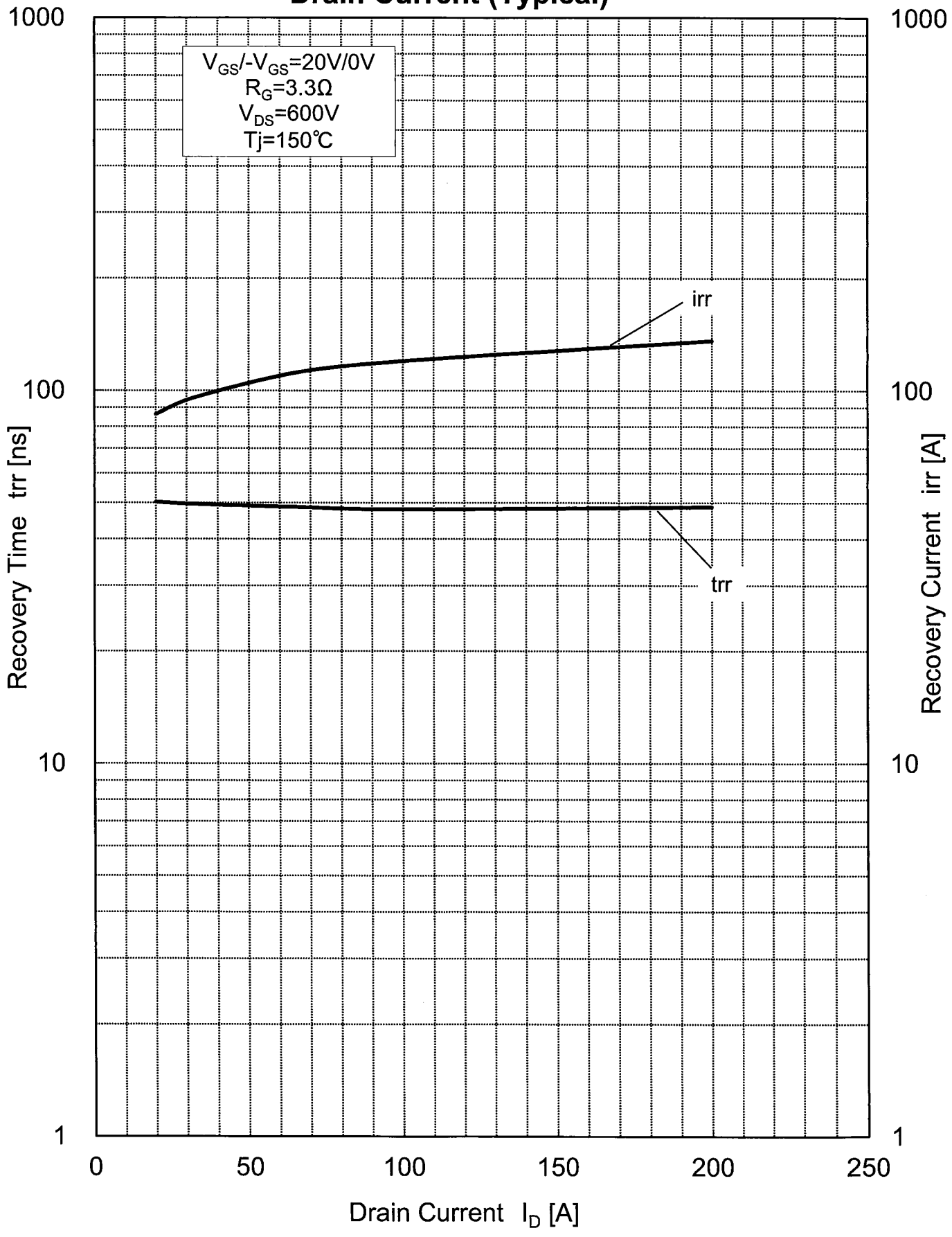


Fig.28 Recovery Characteristics vs Drain Current (Typical)

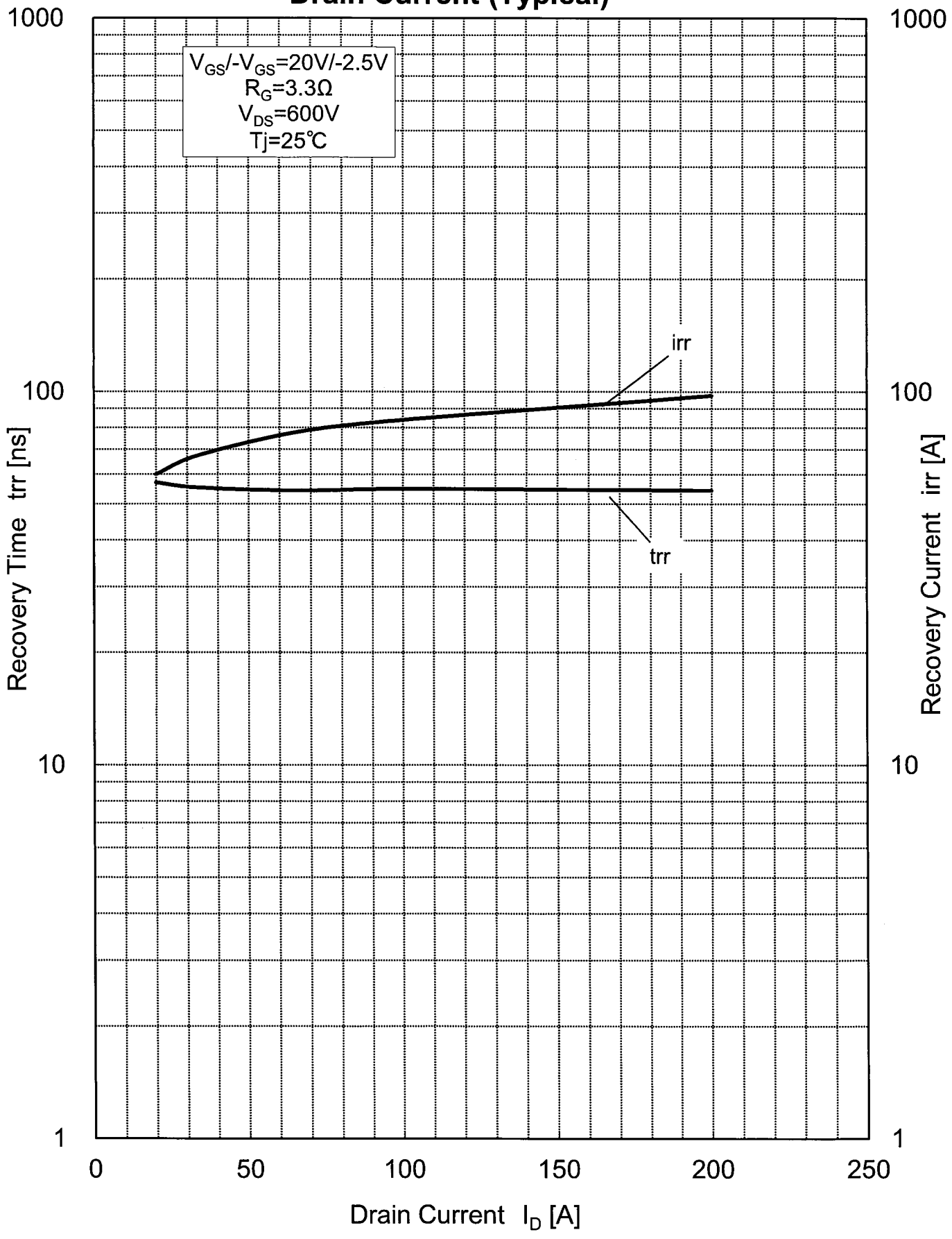


Fig.29 Recovery Characteristics vs Drain Current (Typical)

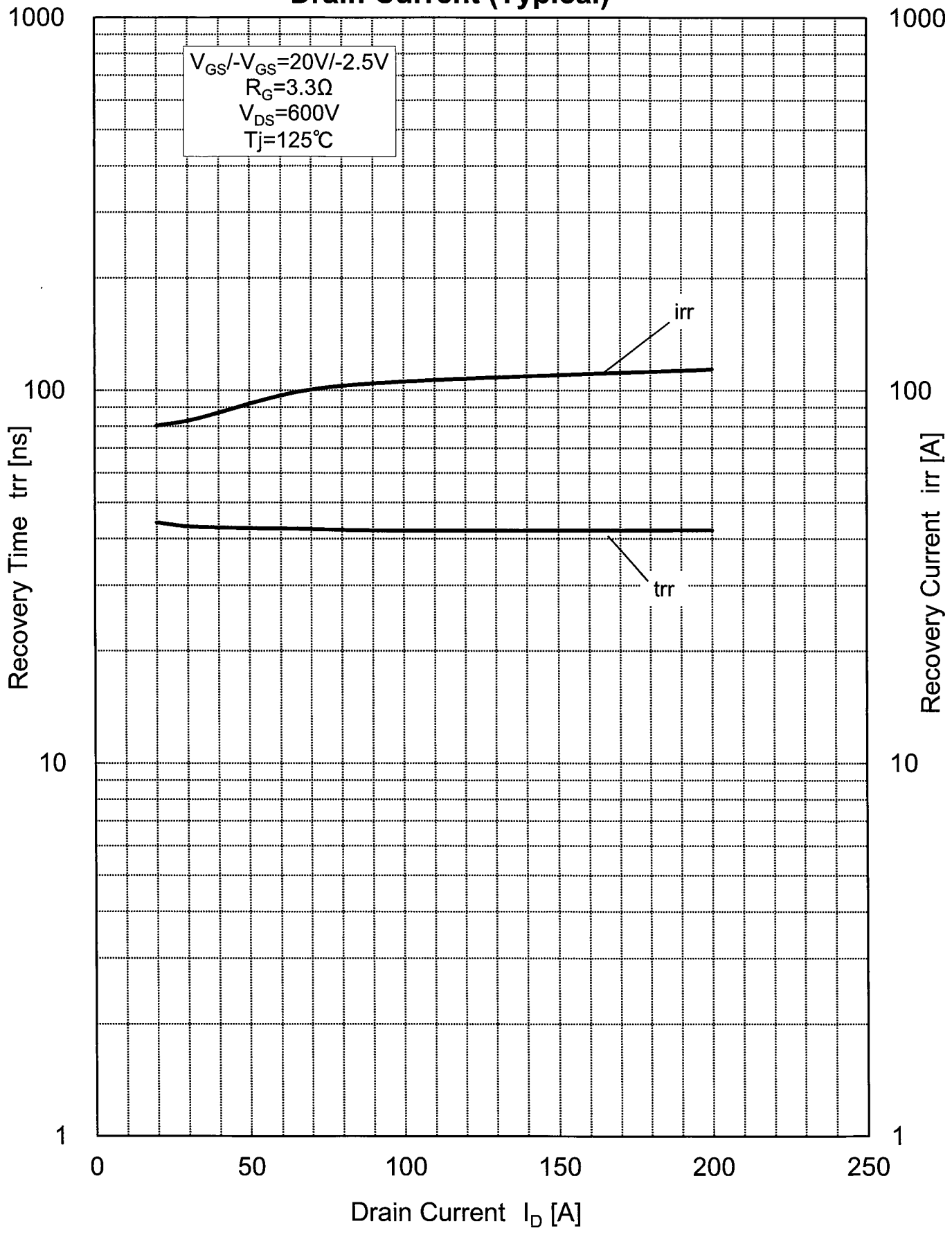


Fig.30 Recovery Characteristics vs Drain Current (Typical)

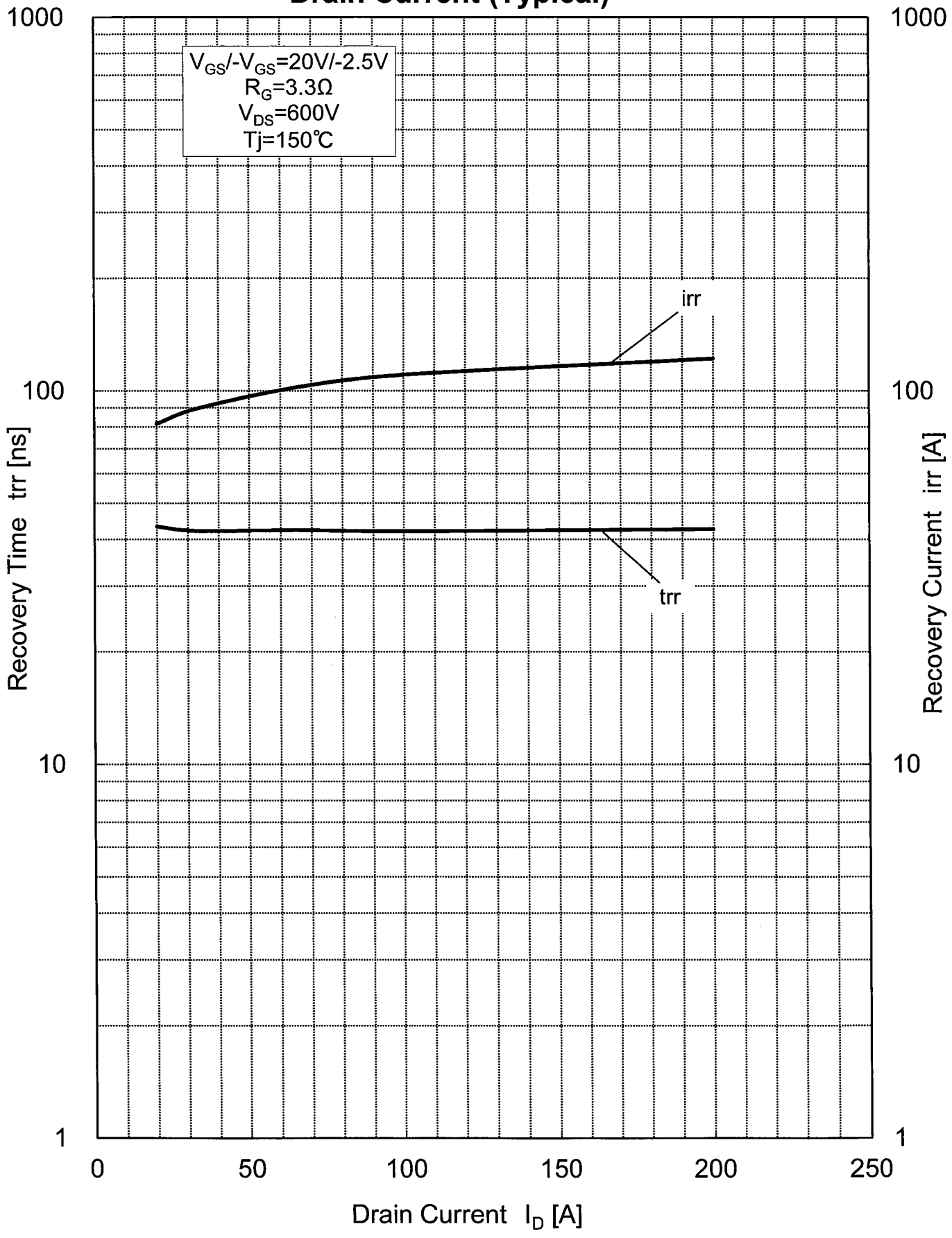


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Fig.31 Recovery Characteristics vs Drain Current (Typical)

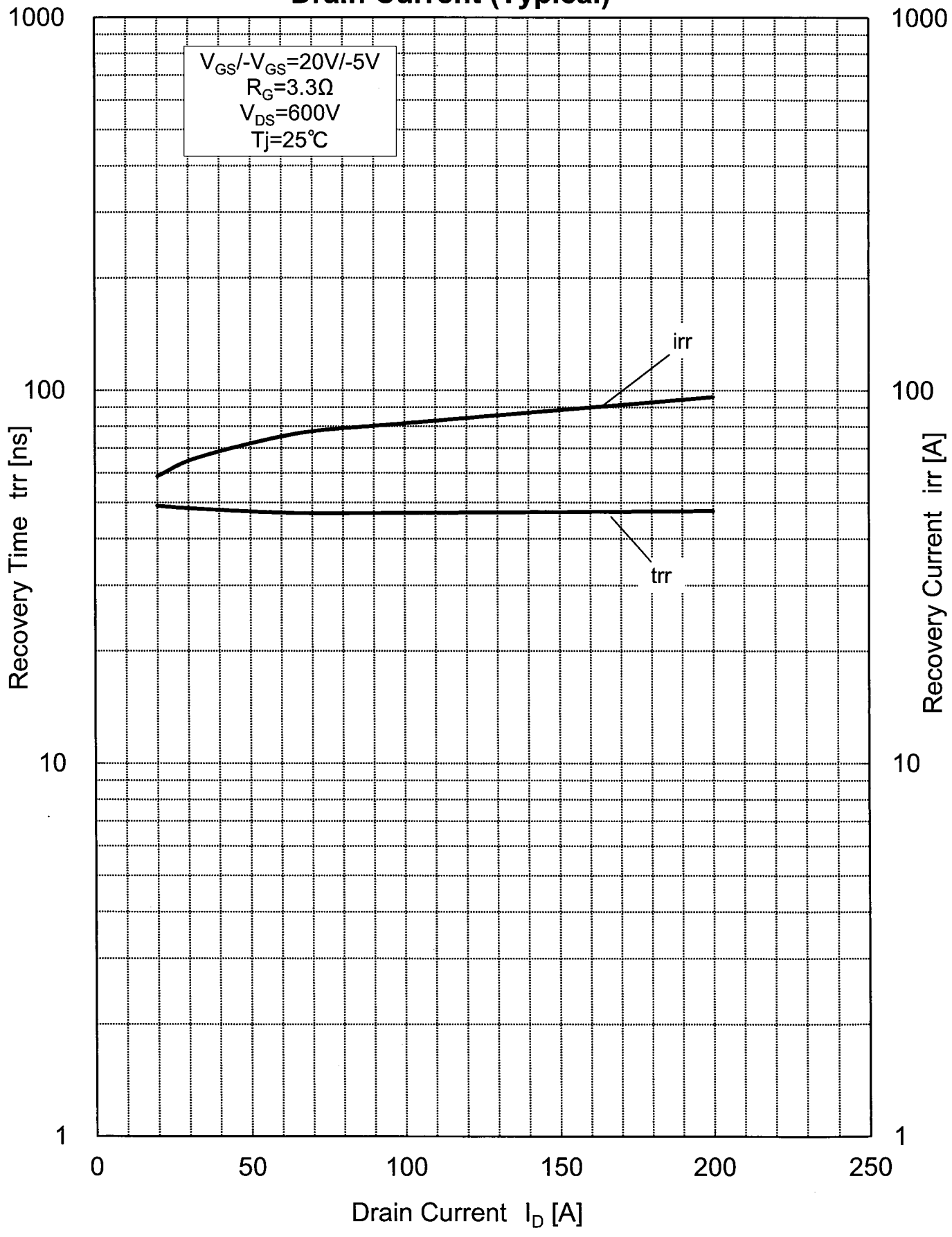

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Fig.32 Recovery Characteristics vs Drain Current (Typical)

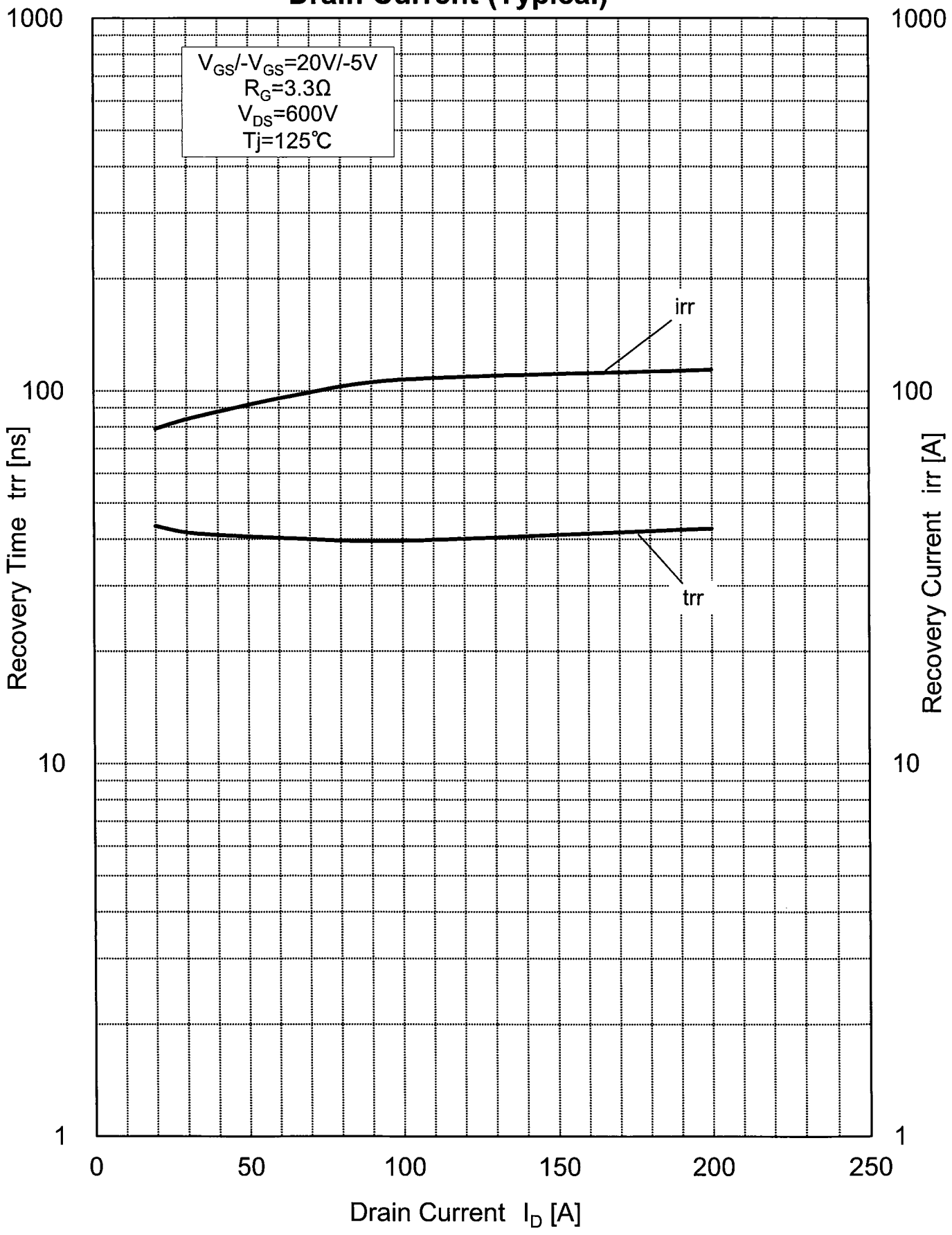

Fig.33 Recovery Characteristics vs Drain Current (Typical)

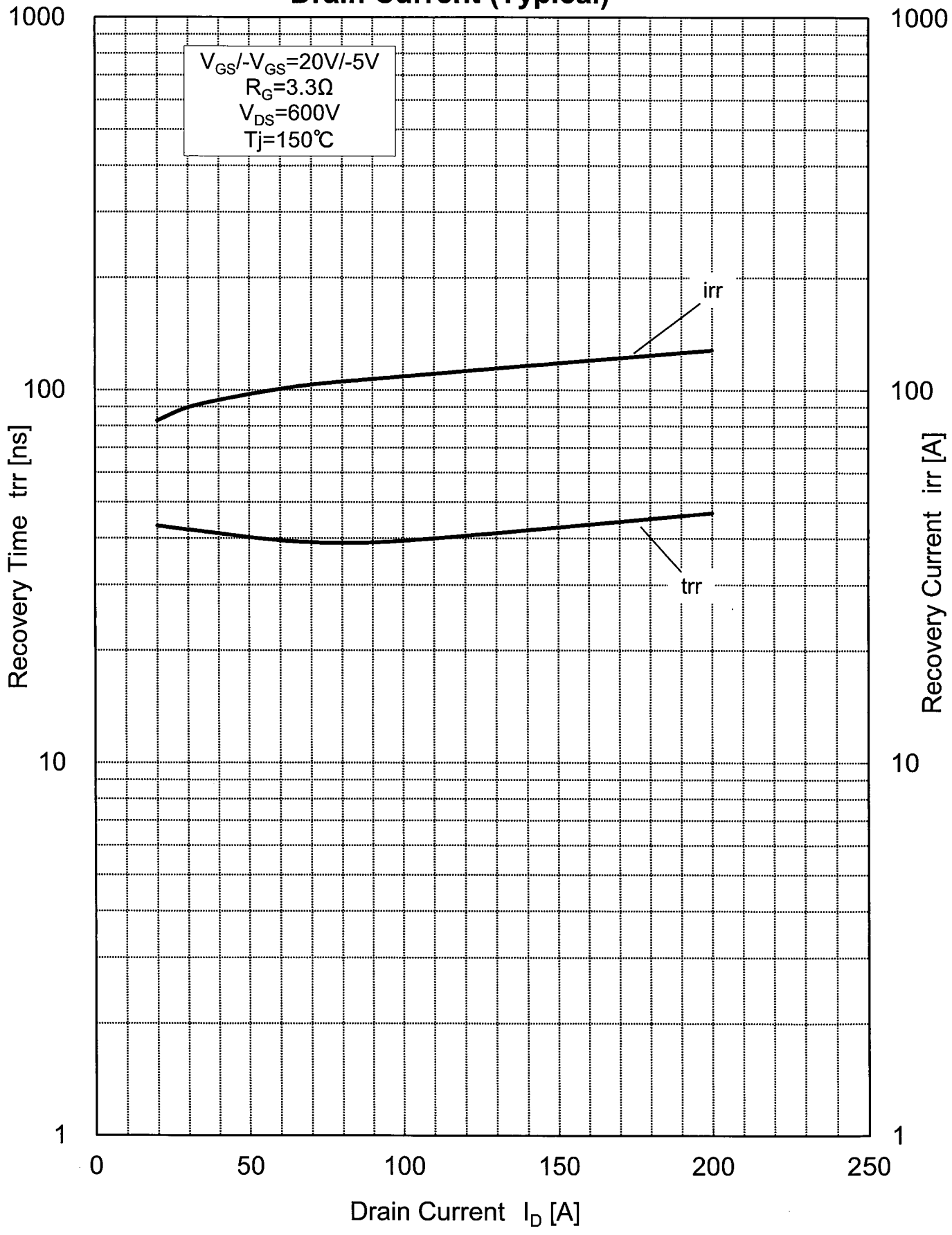

Fig.34 Recovery Characteristics vs Gate Resistance (Typical)

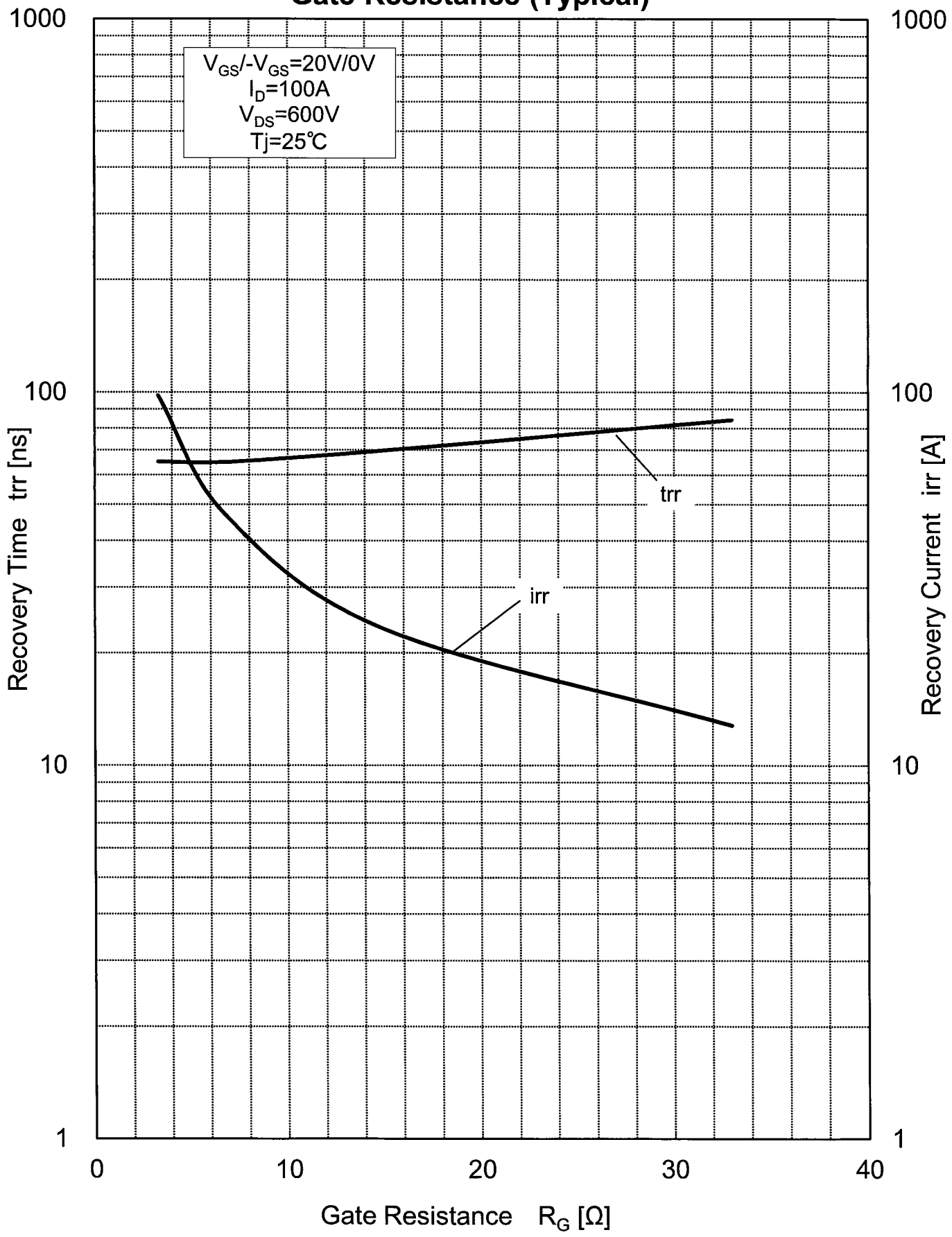

Fig.35 Recovery Characteristics vs Gate Resistance (Typical)

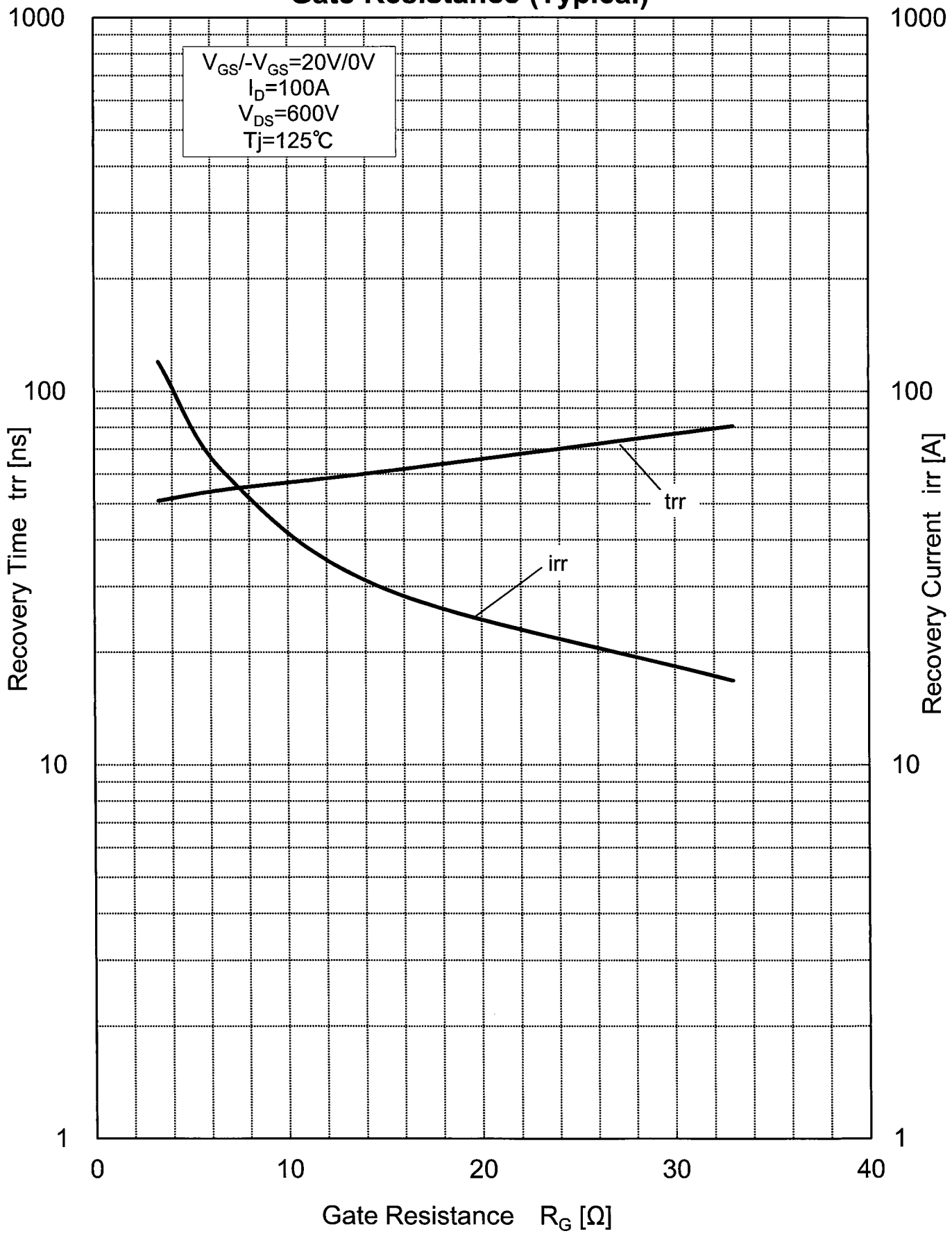

Fig.36 Recovery Characteristics vs Gate Resistance (Typical)

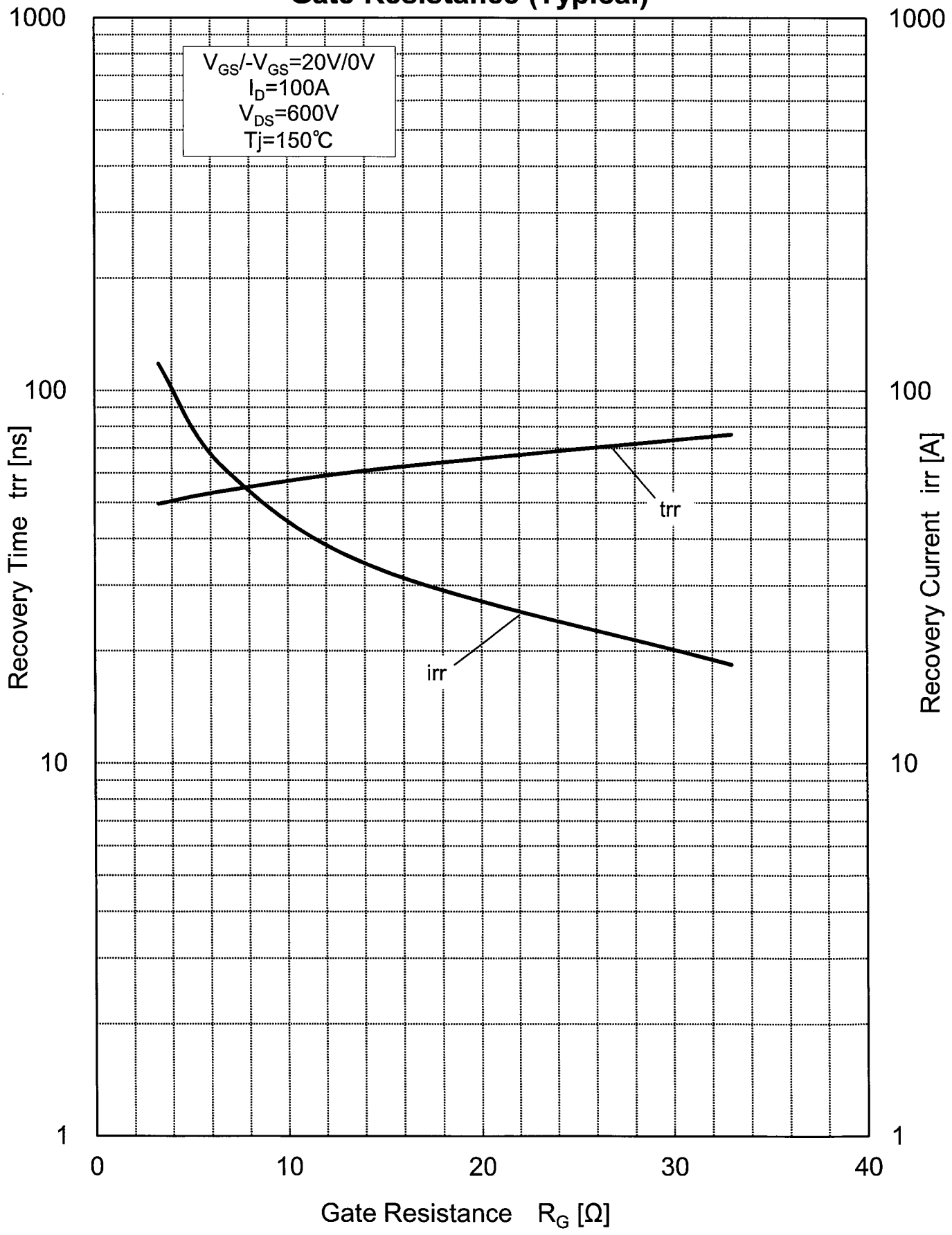

Fig.37 Recovery Characteristics vs Gate Resistance (Typical)

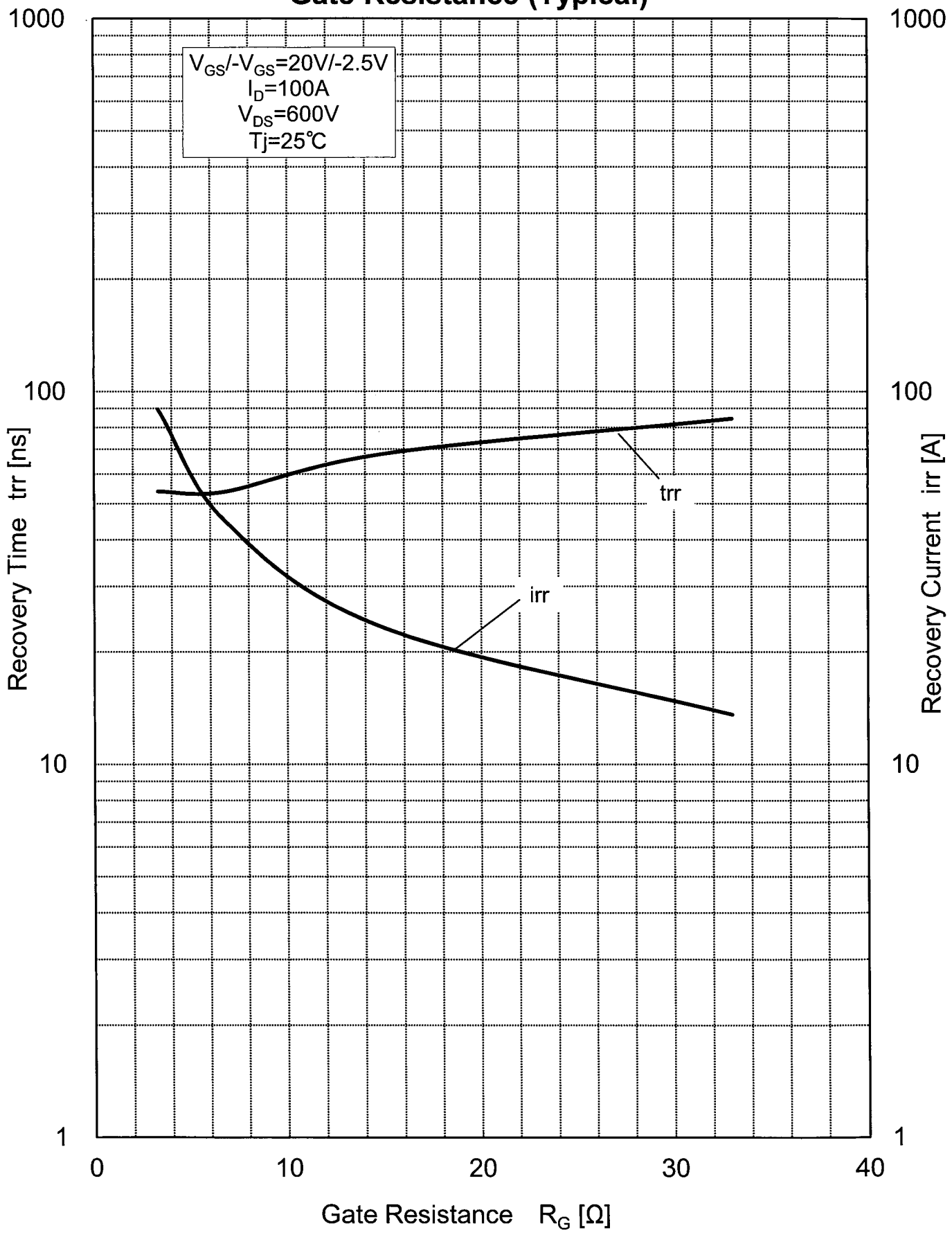

Fig.38 Recovery Characteristics vs Gate Resistance (Typical)

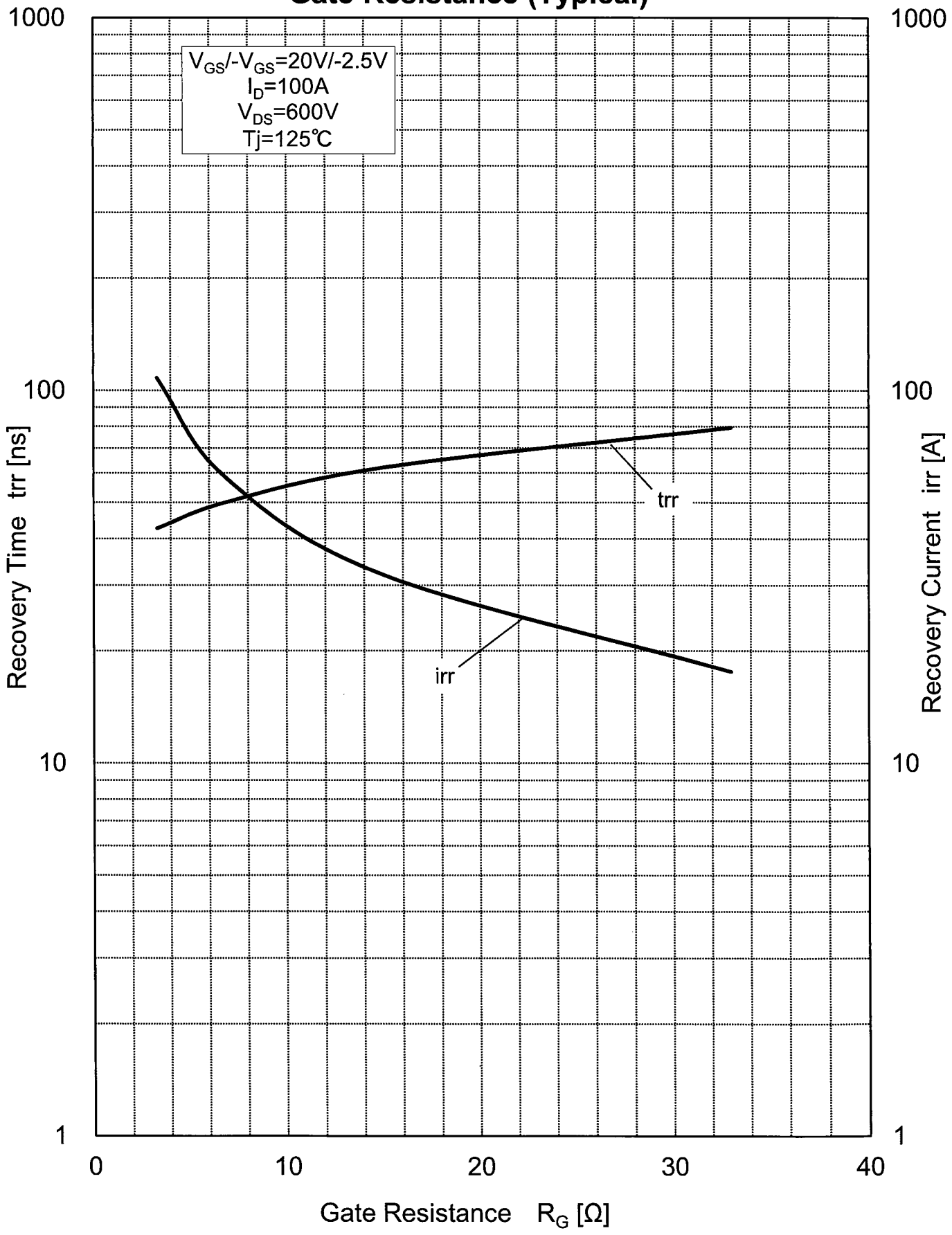

Fig.39 Recovery Characteristics vs Gate Resistance (Typical)

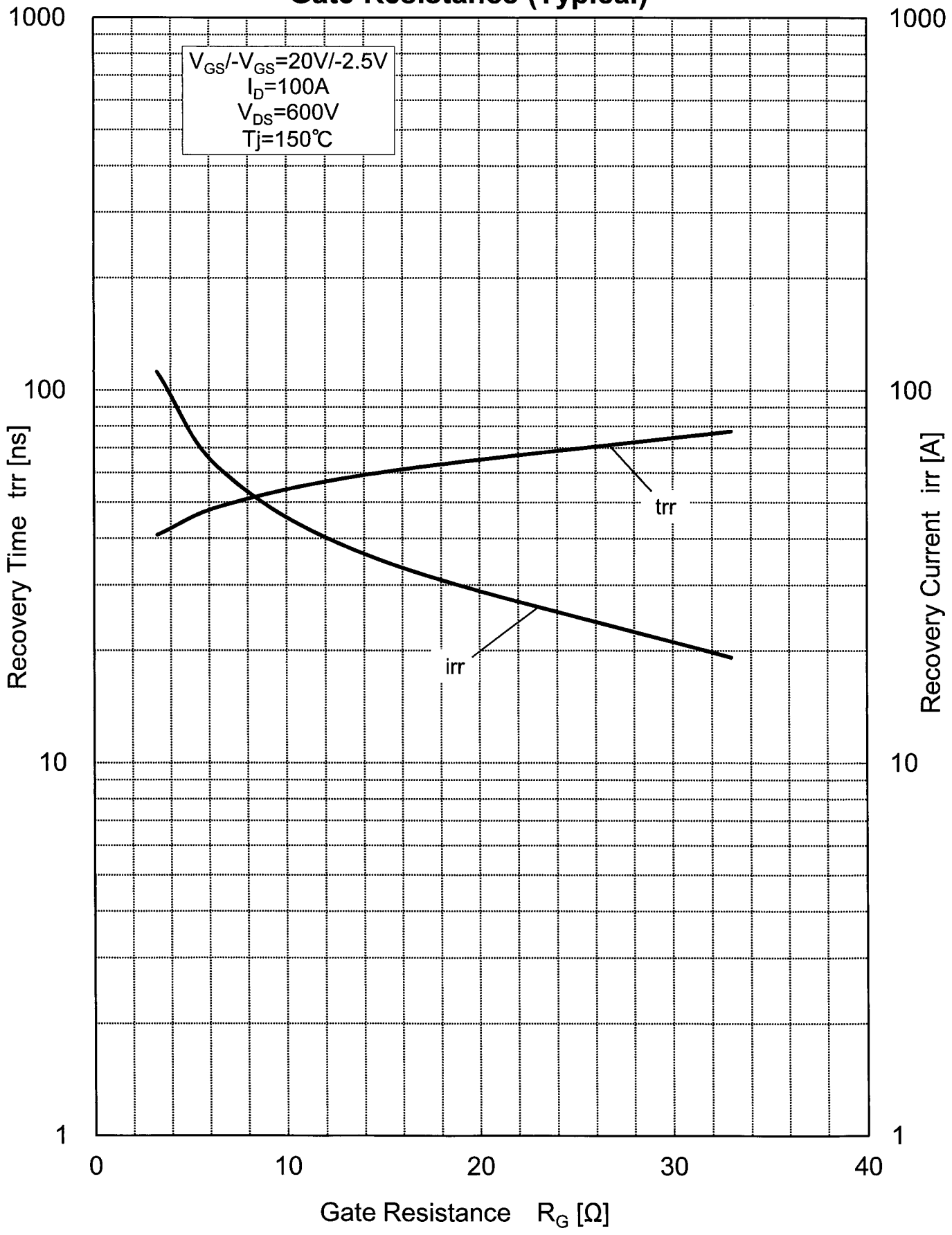

Fig.40 Recovery Characteristics vs Gate Resistance (Typical)

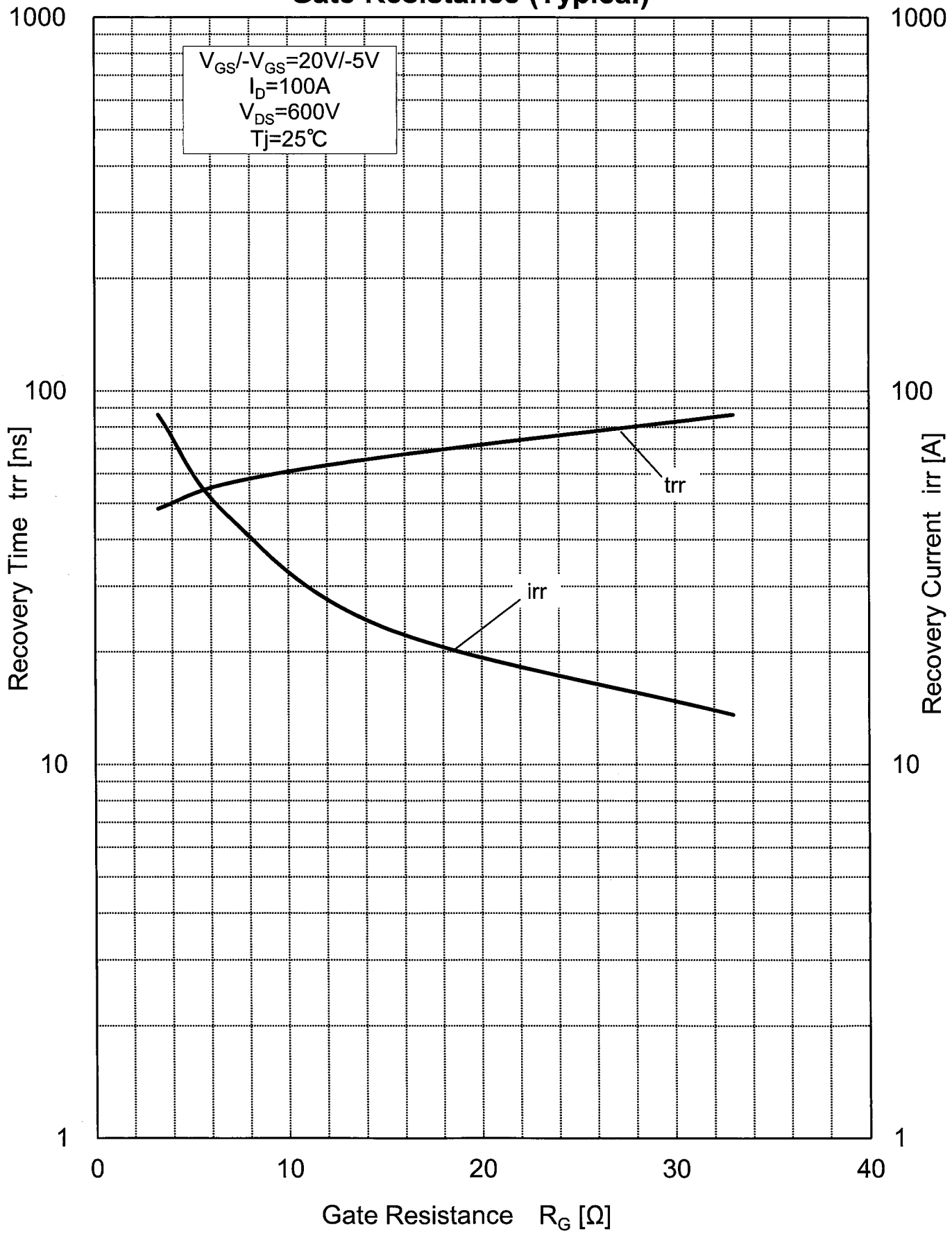

Fig.41 Recovery Characteristics vs Gate Resistance (Typical)

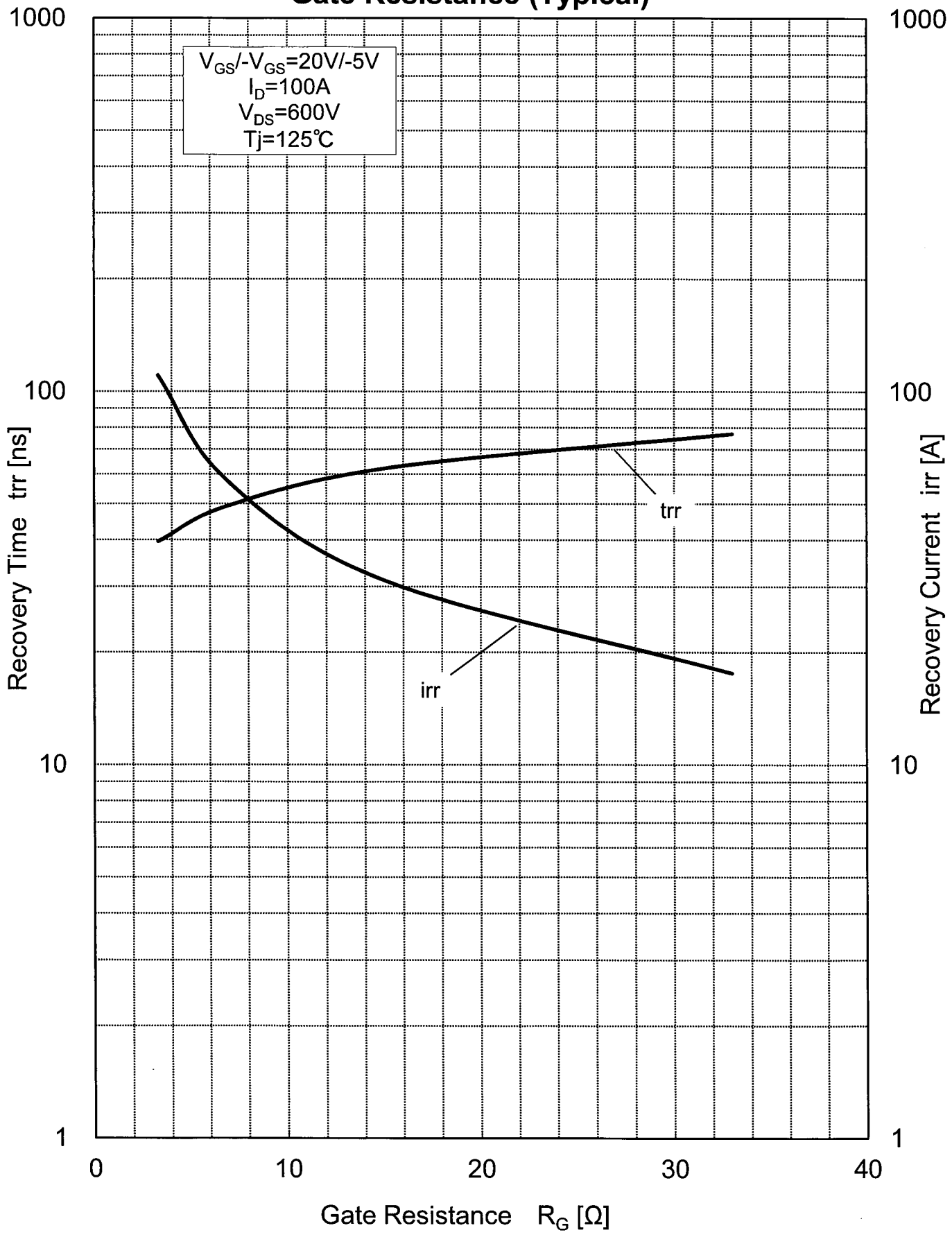

Fig.42 Recovery Characteristics vs Gate Resistance (Typical)

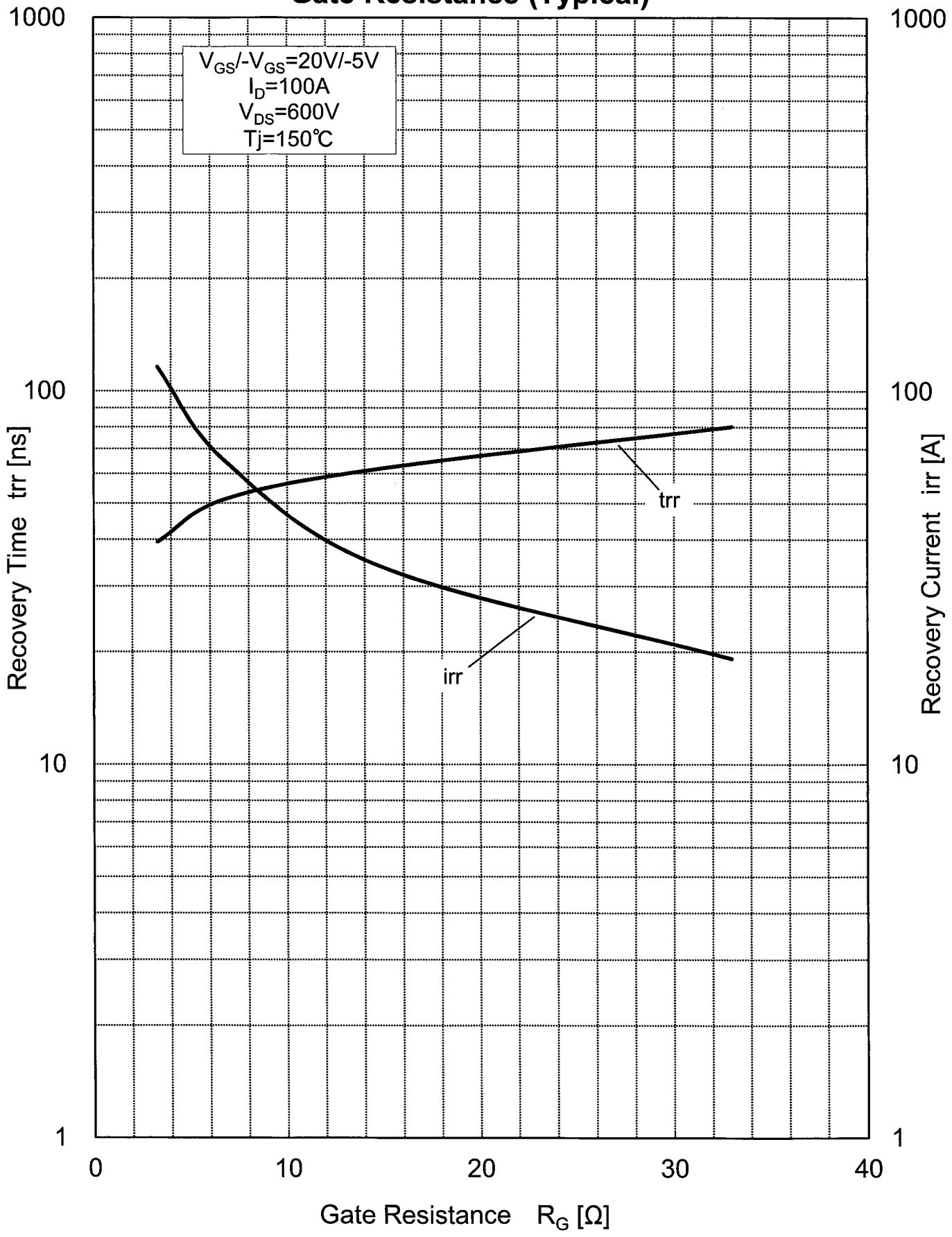

Fig.43 Safe Operating Area

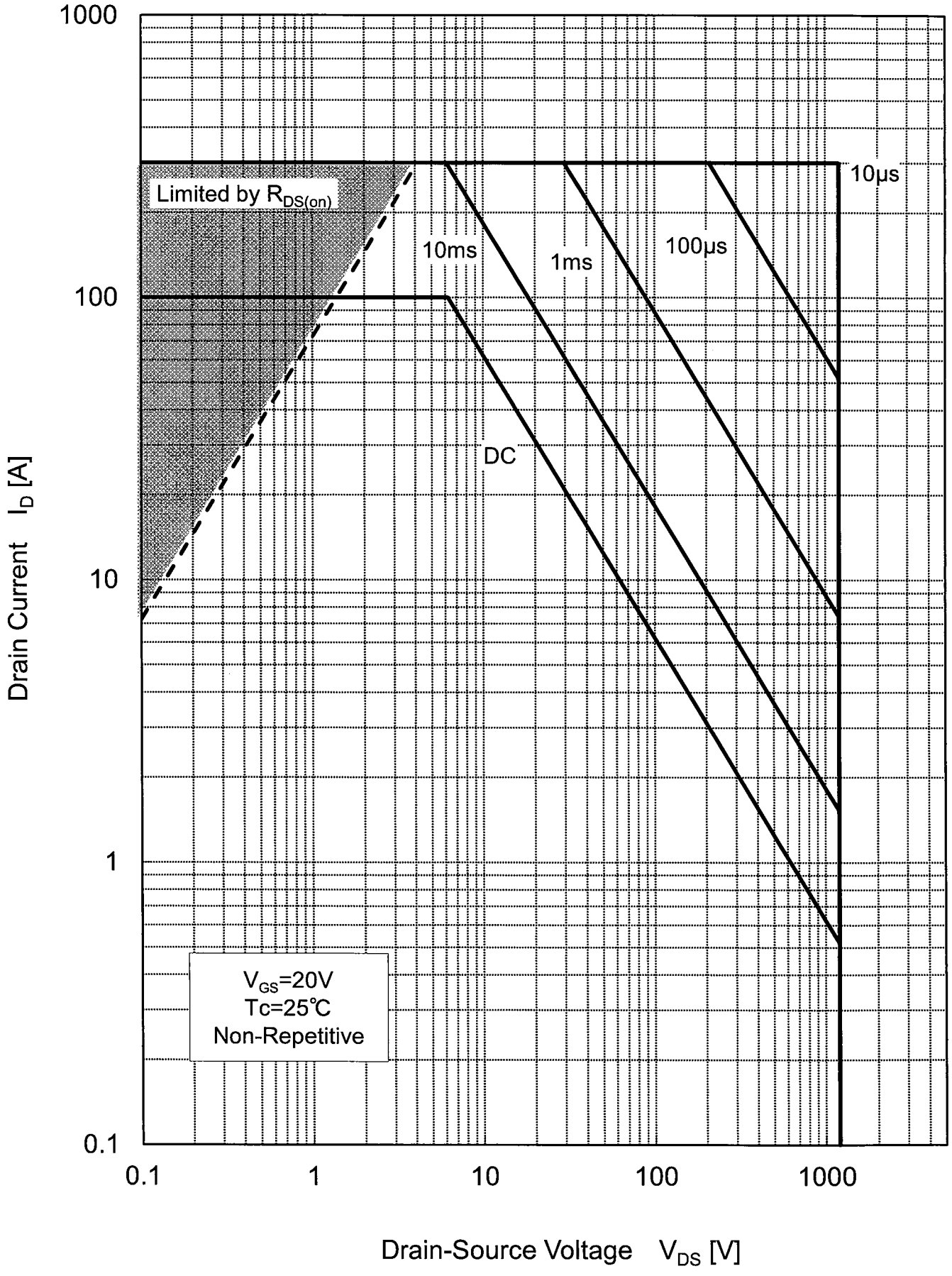

Fig.44 Transient Thermal Impedance