

# 2MI50F-050

SIPMOS® FUJI POWER MOS-FET

N-CHANNEL SILICON POWER MOS-FET

## MOS-FET MODULE

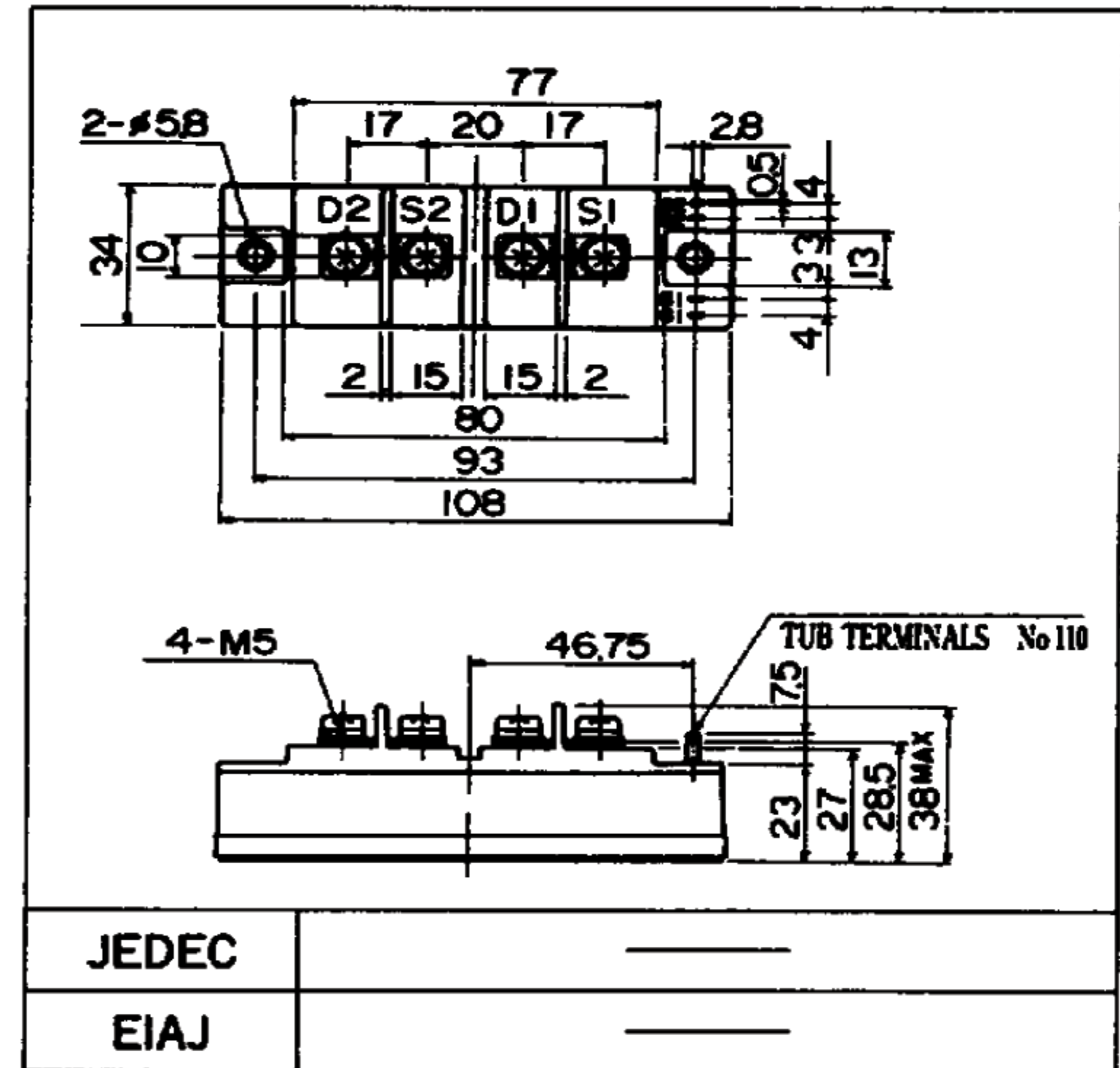
### ■ Features

- Low on-resistance
- High current
- Insulated to elements and metal base
- Separated two-elements
- Include fast recovery diode

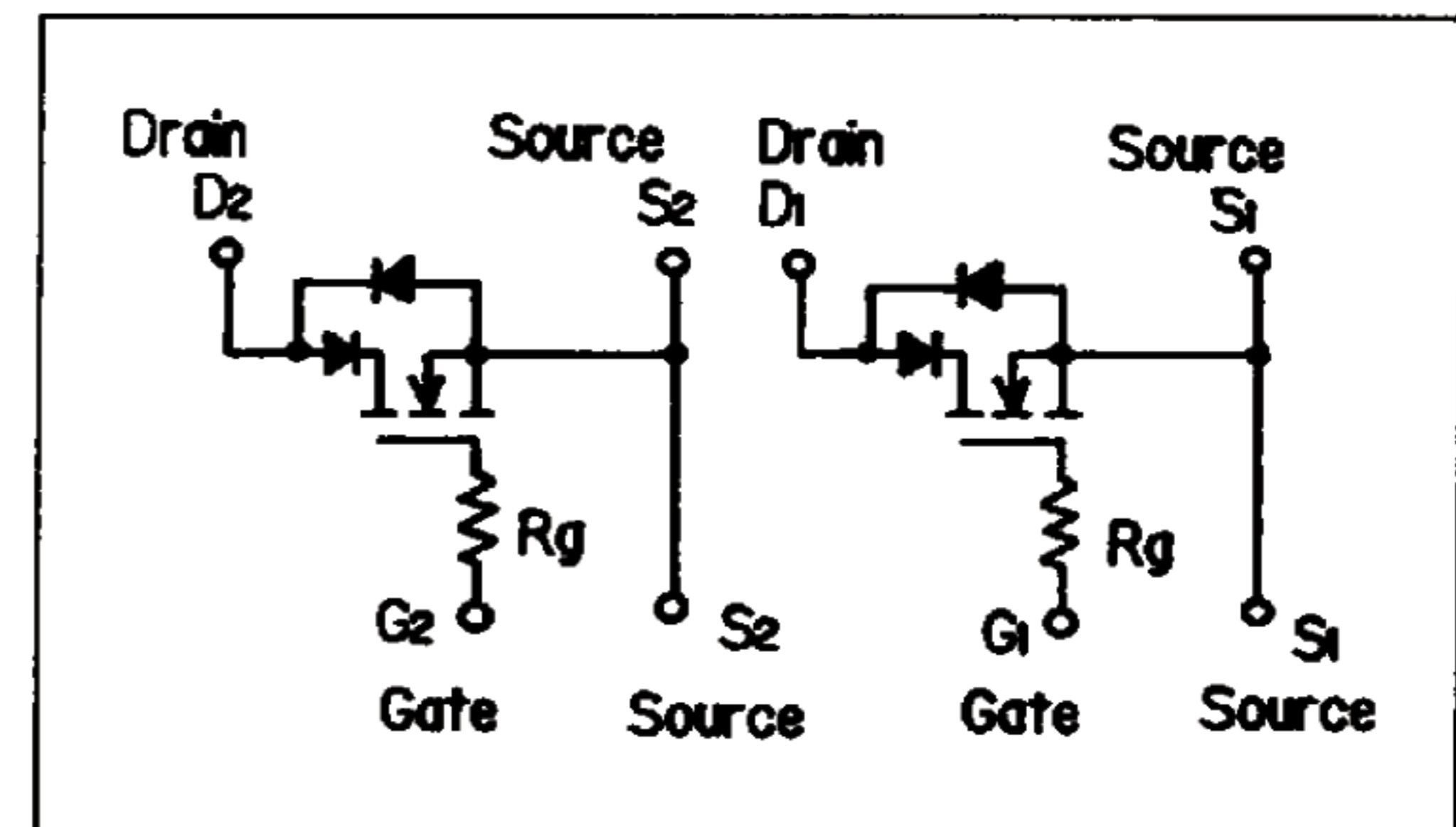
### ■ Applications

- Inverters
- UPS
- A. C servo motors
- High frequency power supplies

### ■ Outline Drawings



### ■ Equivalent Circuit Schematic



### ■ Max. Ratings and Characteristics

#### ● Absolute Maximum Ratings (Tc = 25°C)

Items	Symbols	Ratings	Units
Drain-source voltage	V <sub>DSS</sub>	500	V
Continuous drain current	I <sub>D</sub>	50	A
Pulsed drain current	I <sub>D(puls)</sub>	150	A
Continuous reverse drain current	I <sub>DR</sub>	50	A
Gate-source peak voltage	V <sub>GSS</sub>	±20	V
Max. power dissipation	P <sub>D</sub>	400	W
Operating and storage temperature range	T <sub>ch</sub>	150	°C
	T <sub>stg</sub>	-40 ~ +125	°C
Isolation test voltage	V <sub>iso</sub>	2500	V

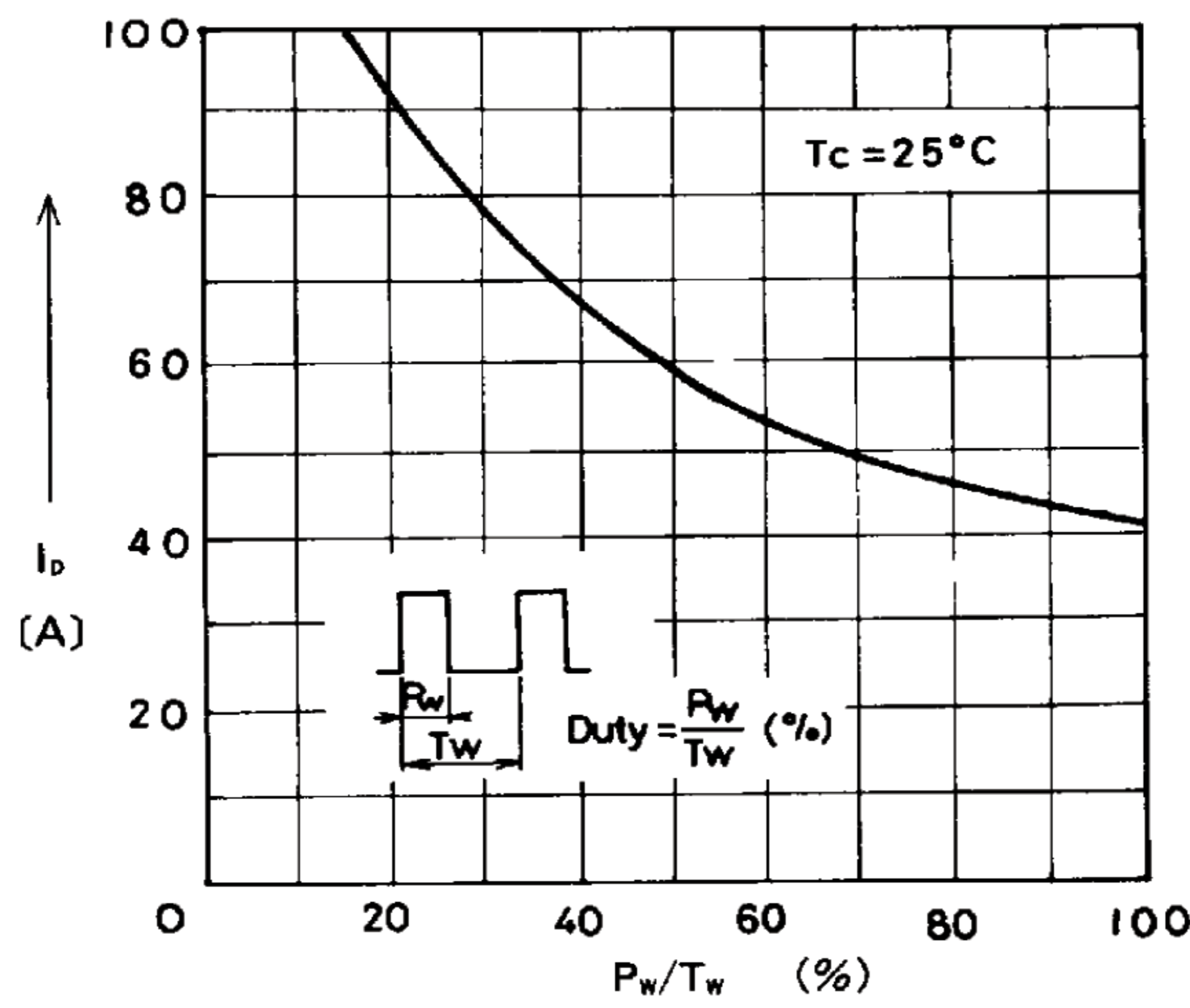
#### ● Electrical Characteristics (Tc = 25°C)

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V I <sub>D</sub> = 1mA	500			V
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> I <sub>D</sub> = 10mA	2.1	3.0	4.0	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>GS</sub> = 0V V <sub>DS</sub> = 500V T <sub>ch</sub> = 25°C			1.0	mA
Gate-source leakage current	I <sub>GSS</sub>	V <sub>DS</sub> = 0V V <sub>GS</sub> = ±20V			100	nA
Drain-source on-state resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 15V I <sub>D</sub> = 25A			0.11	Ω
Forward transconductance	g <sub>fs</sub>	V <sub>DS</sub> = 25V I <sub>D</sub> = 25A		45		S
Input capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0V		7.8	13	nF
Output capacitance	C <sub>oss</sub>	V <sub>DS</sub> = 25V		0.9	1.5	
Reverse transfer capacitance	C <sub>rss</sub>	f = 1MHz		0.4	0.6	
Switching time (t <sub>off</sub> = t <sub>d(off)</sub> + t <sub>r</sub> )	t <sub>on</sub>	V <sub>CC</sub> = 100V R <sub>G</sub> = 5Ω		530	750	ns
	t <sub>d(off)</sub>	I <sub>D</sub> = 25A P <sub>w</sub> = 20μs		700	1000	
	t <sub>r</sub>	V <sub>GS</sub> = 15V		80	110	
Diode forward on-voltage	V <sub>SD</sub>	I <sub>F</sub> = 50A V <sub>GS</sub> = 0V		1.4	1.8	V
Reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> = 50, A - d <sub>i</sub> /d <sub>t</sub> = 100A/μs V <sub>GS</sub> = 0V			150	ns

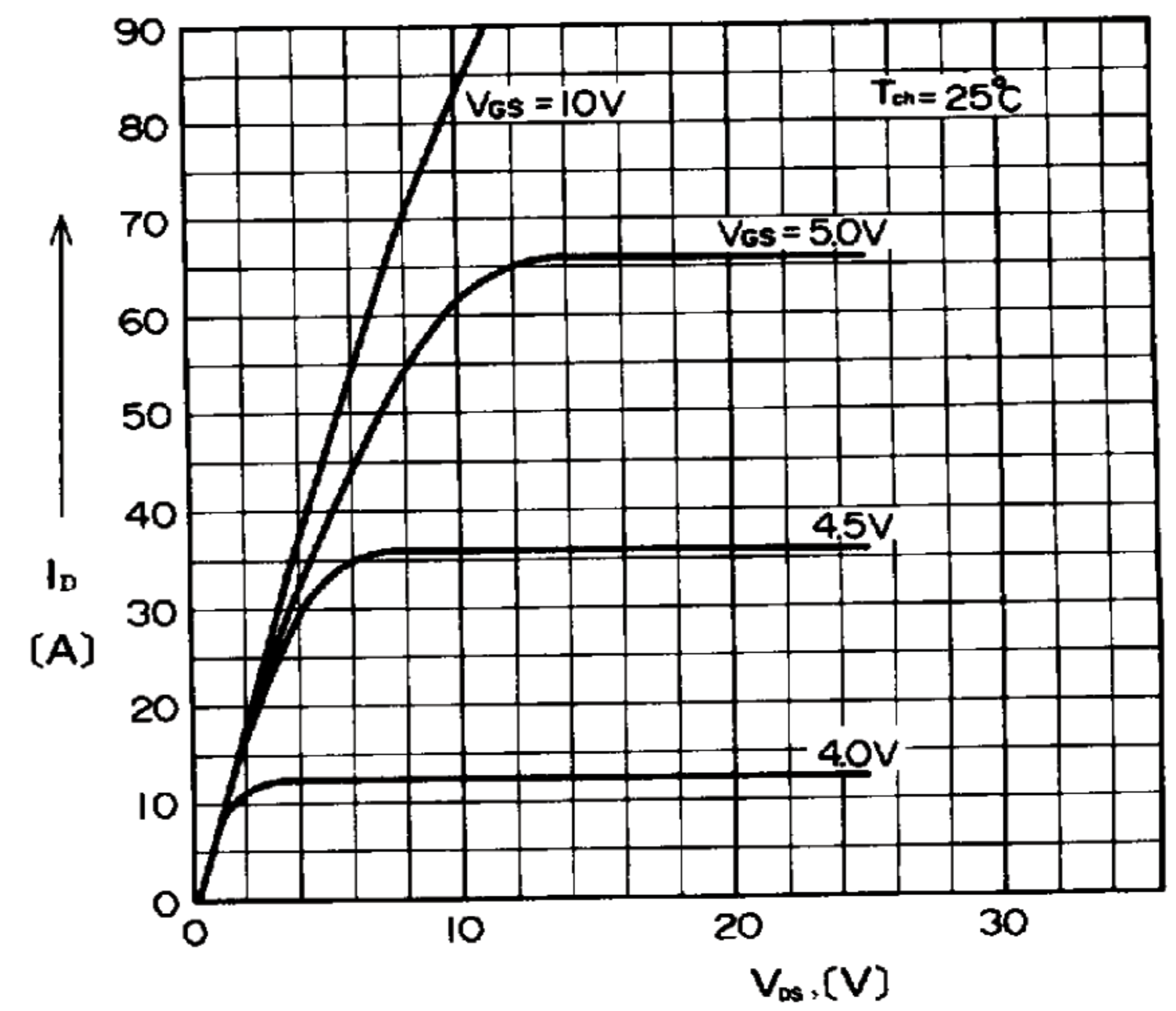
#### ● Thermal Characteristics

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance	R <sub>th(c-f)</sub>	case to fim		0.06		°C/W
	R <sub>th(ch-c)</sub>	channel to case			0.312	°C/W

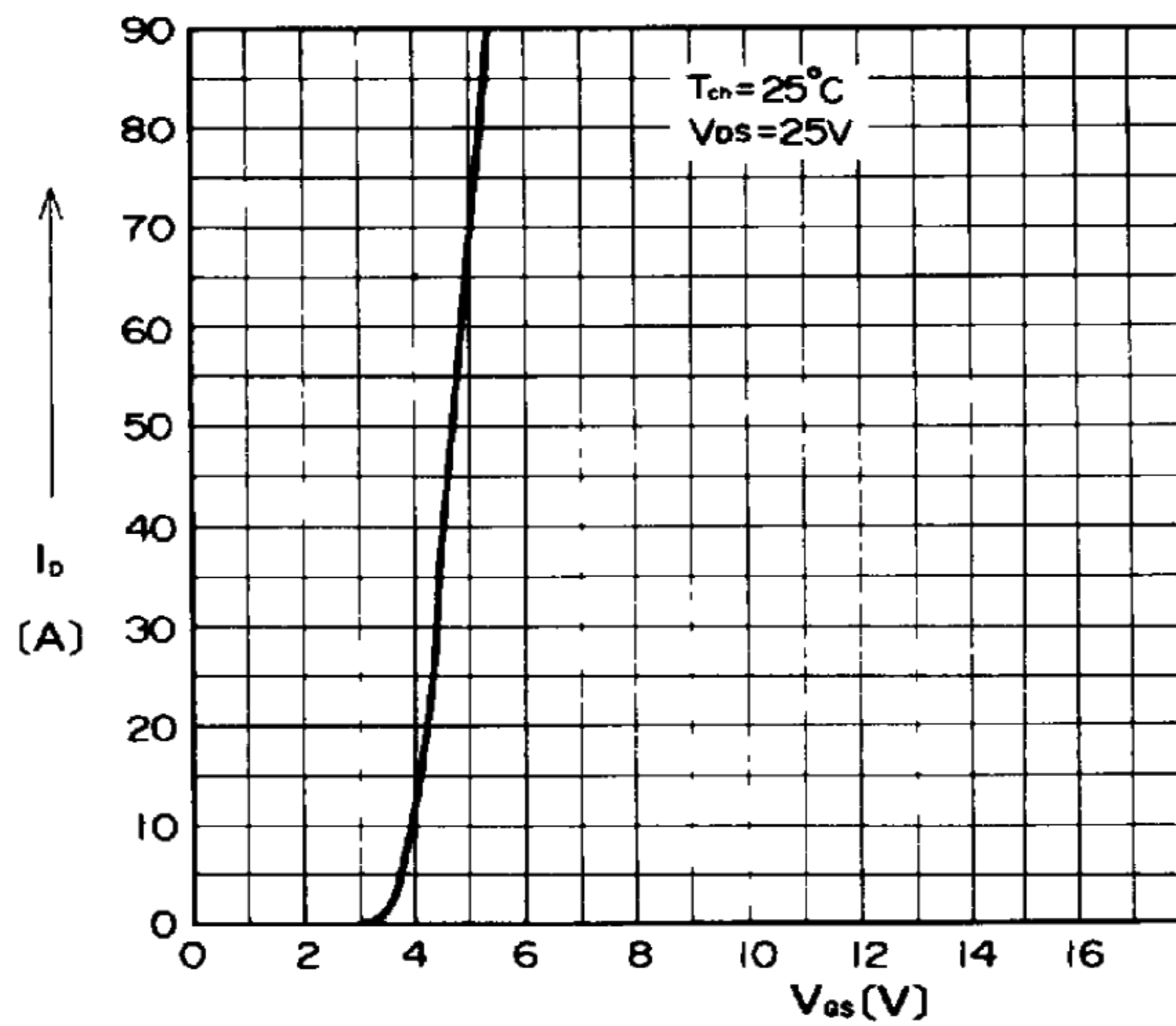
■ Characteristics



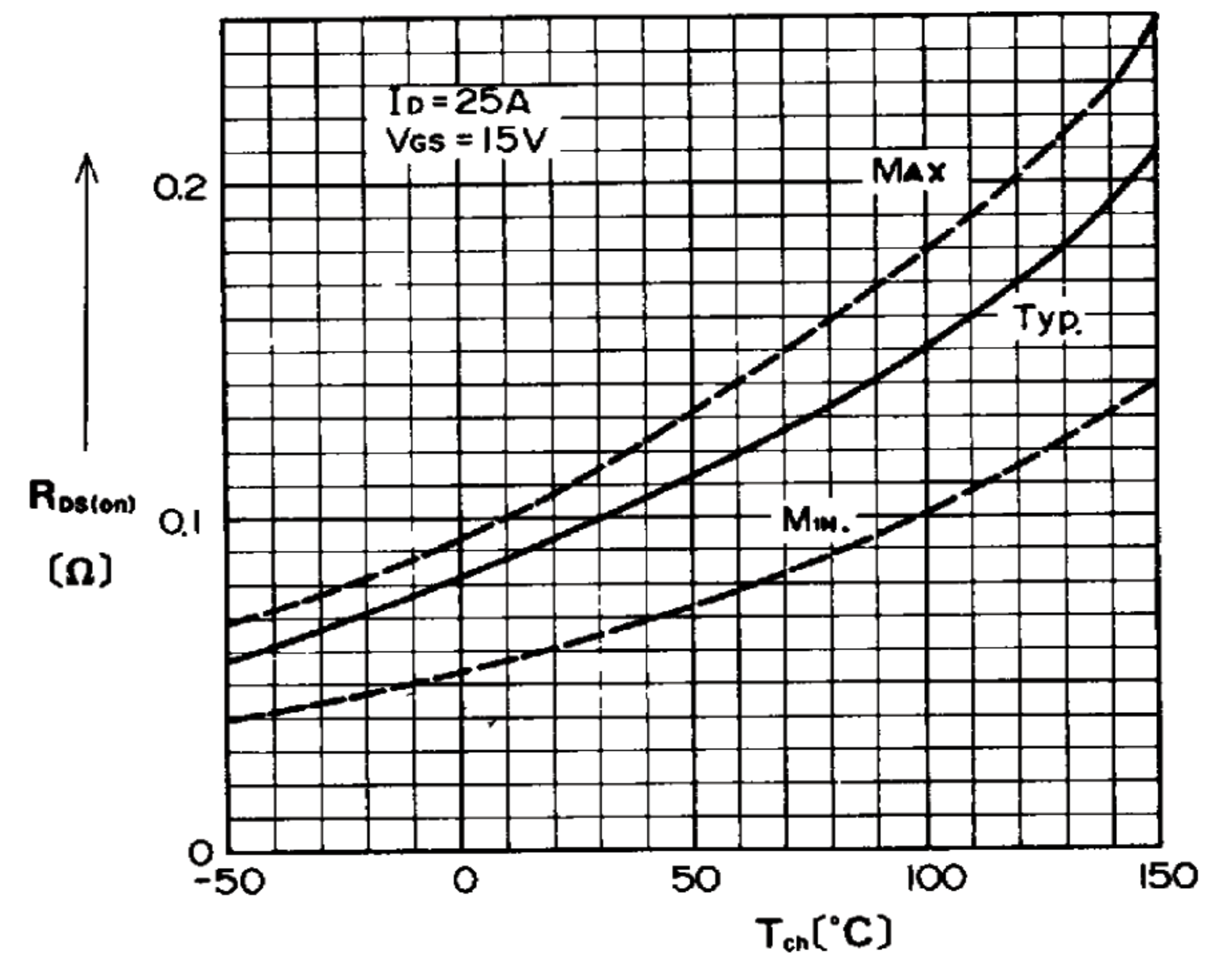
Current Duty Characteristics



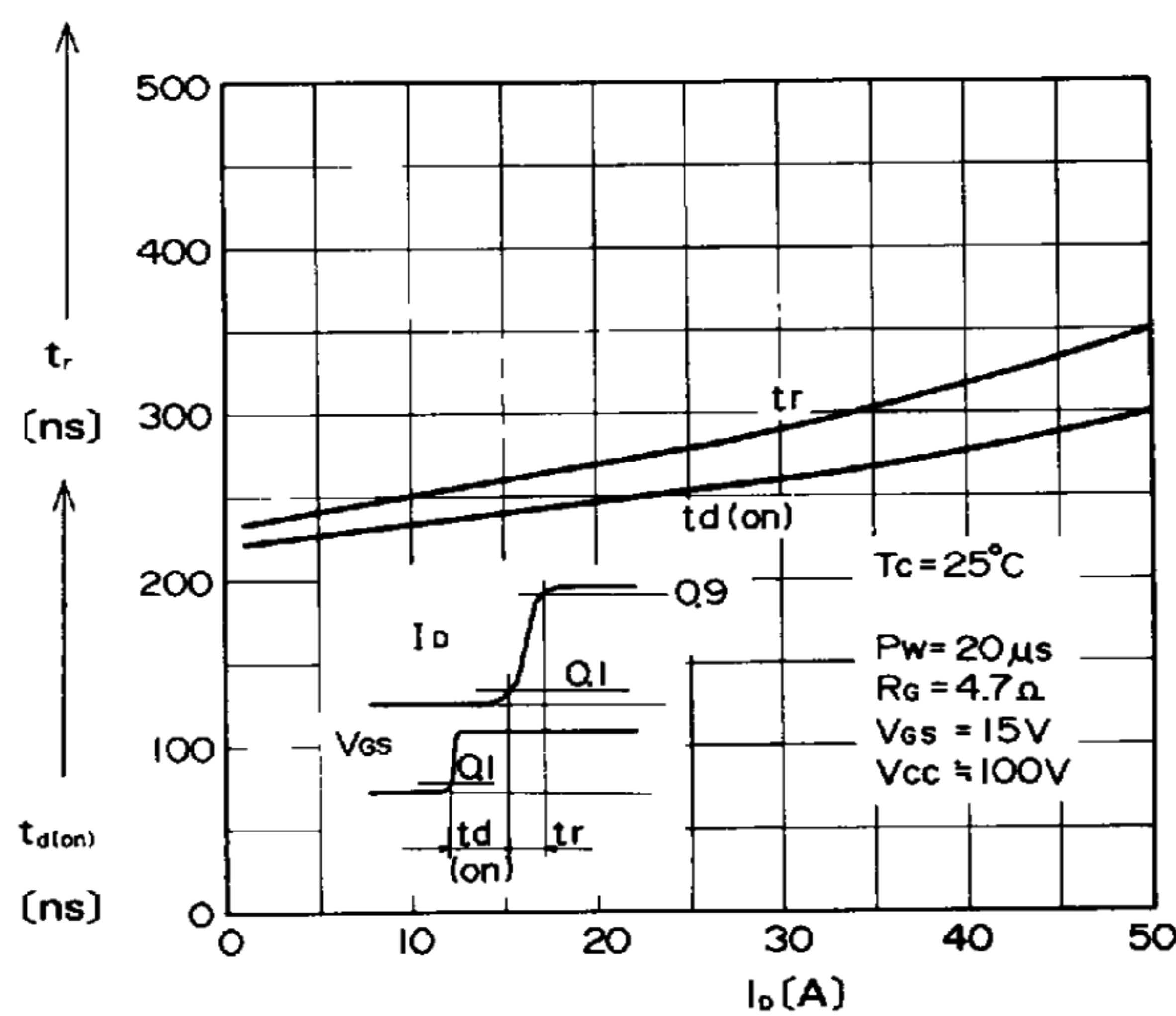
Typical Output Characteristics



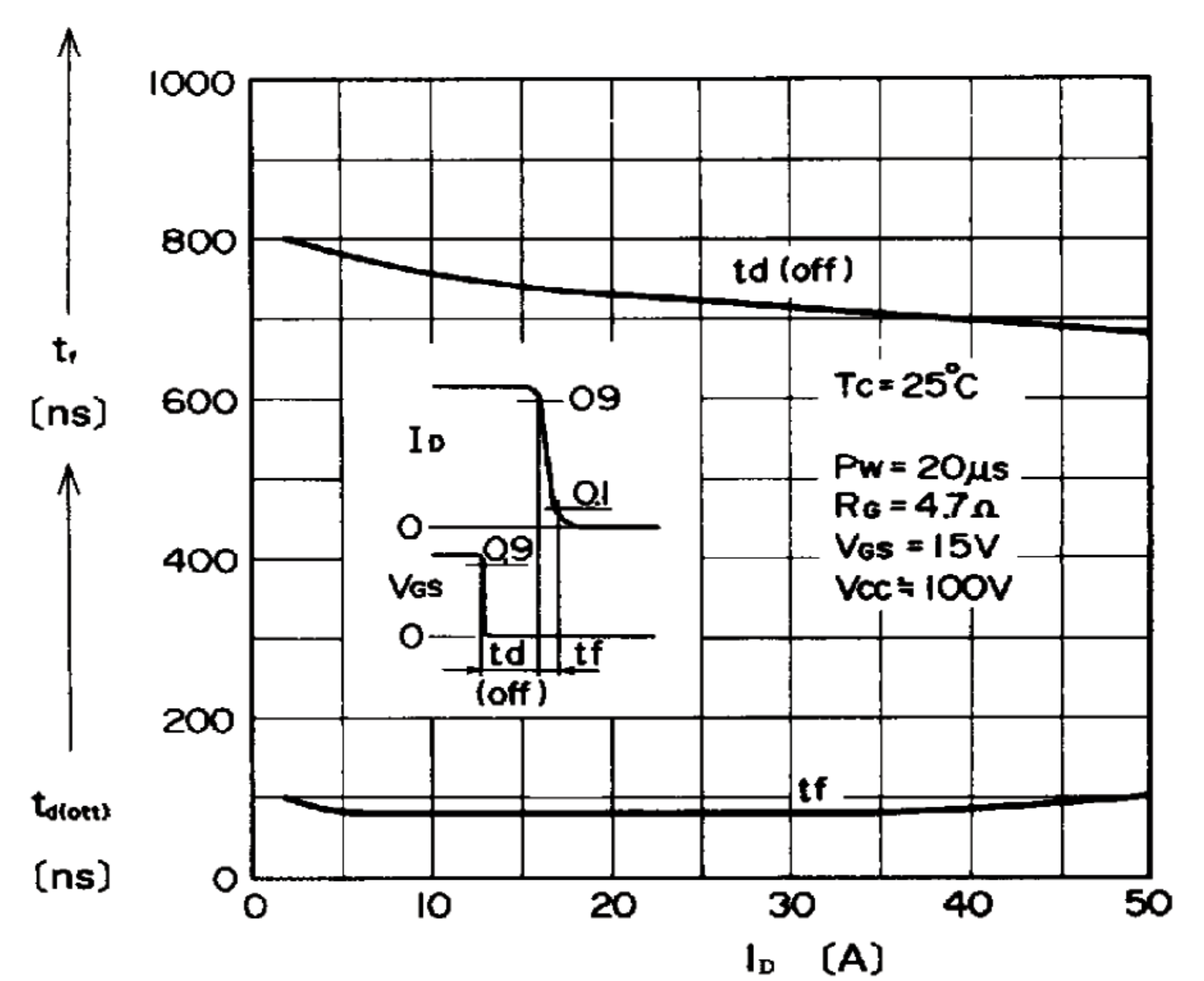
Typical Transfer Characteristics



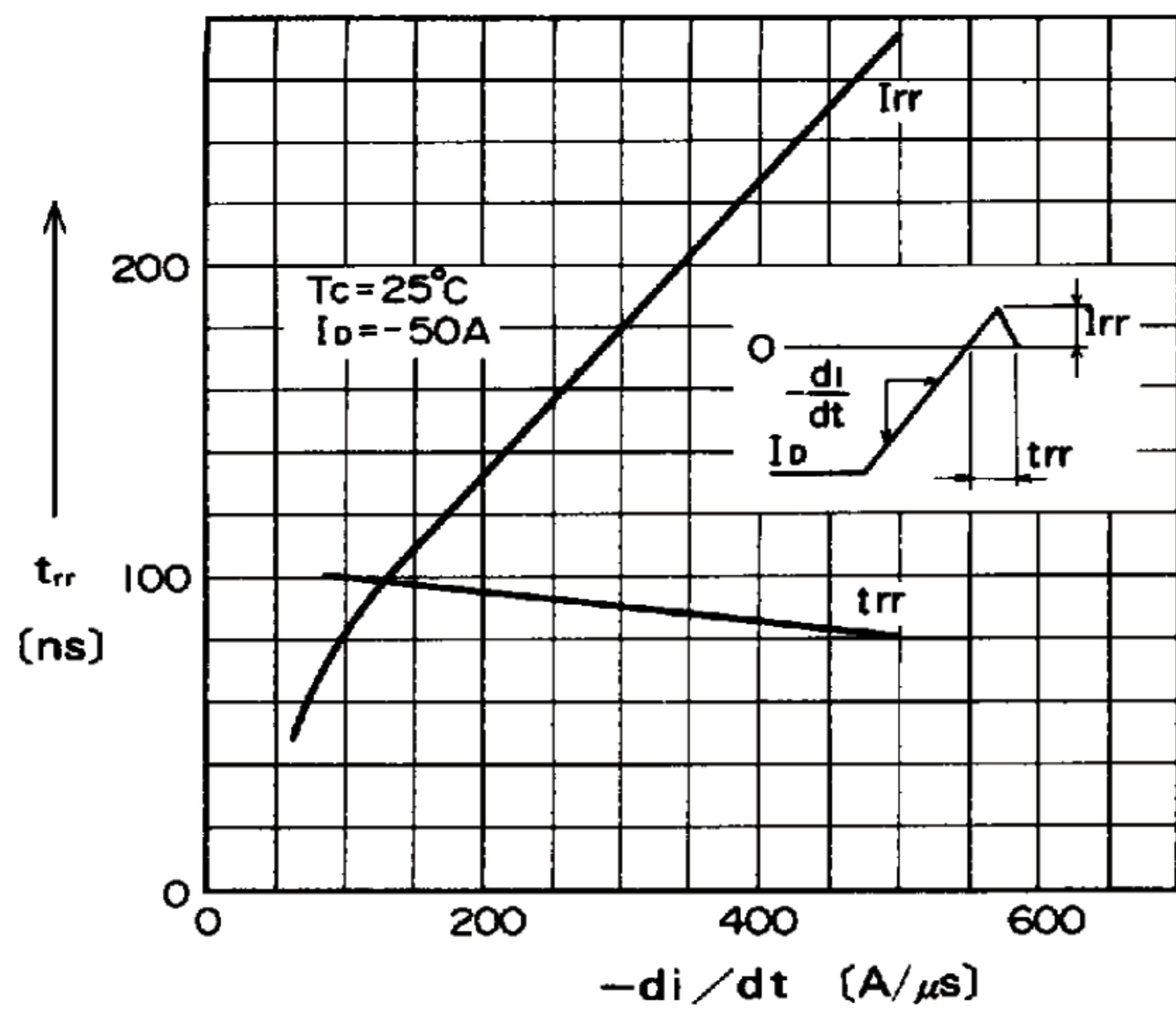
$R_{DS(on)}-T_{ch}$  Characteristics



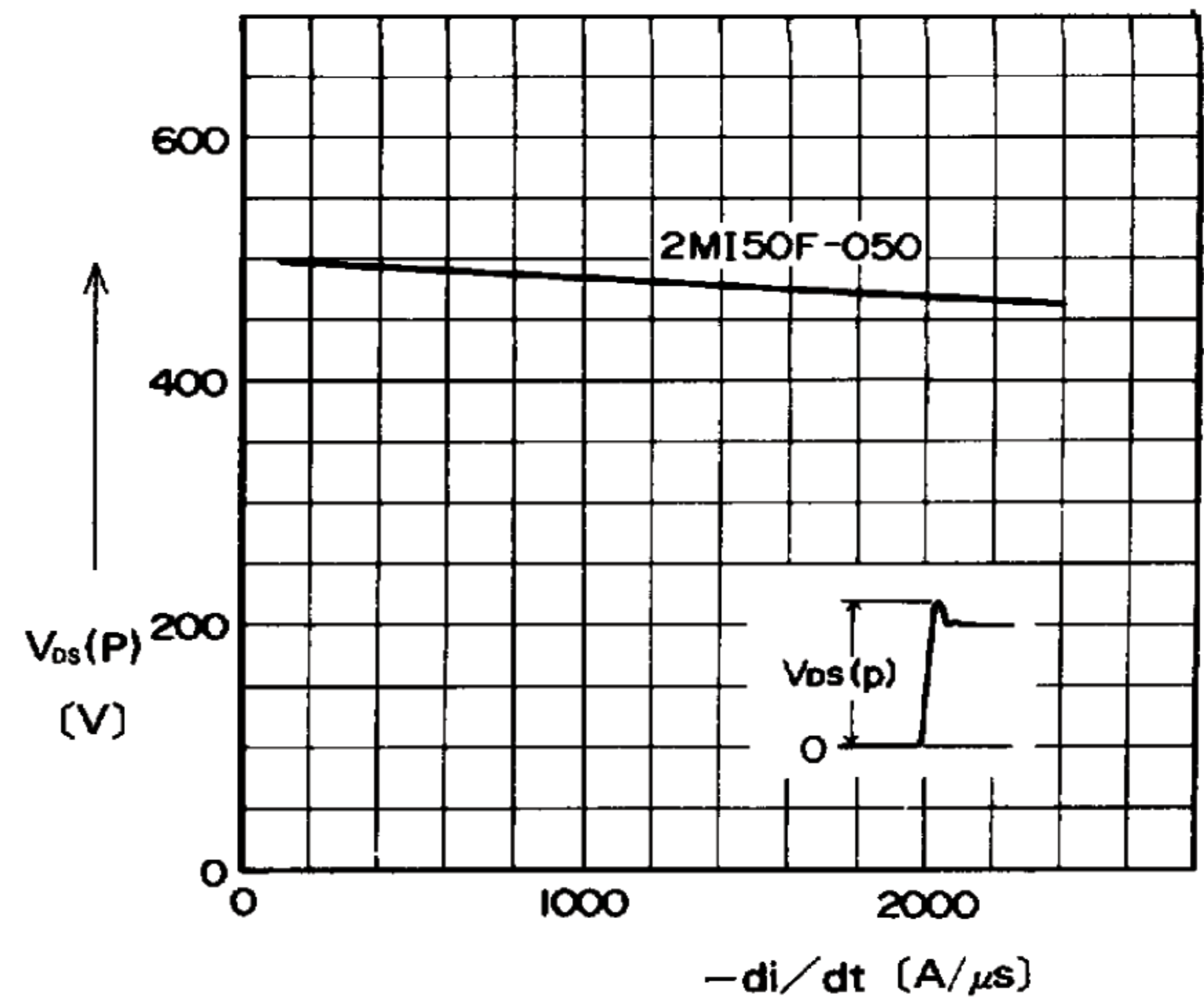
Turn-ON Characteristics



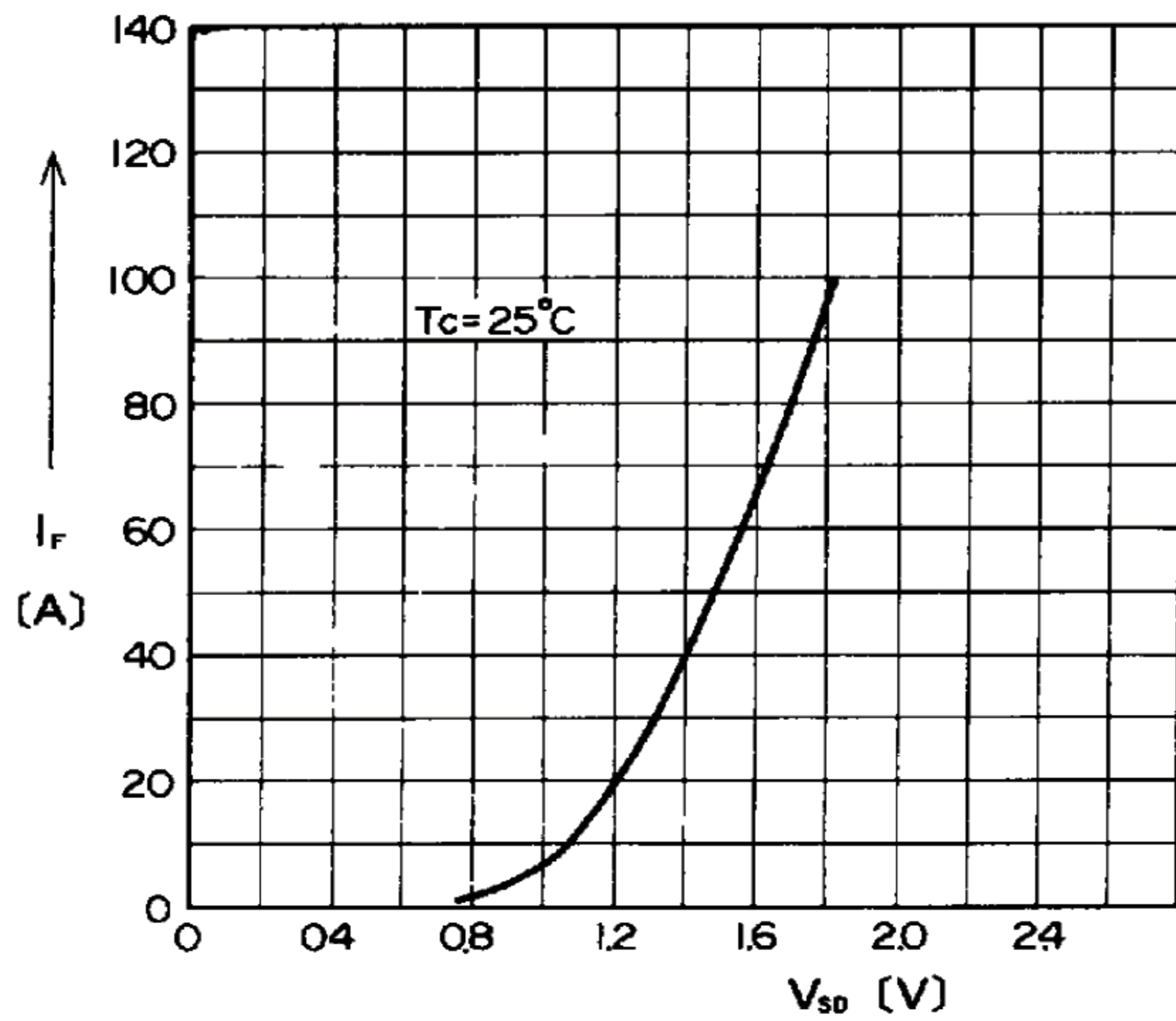
Turn-OFF Characteristics



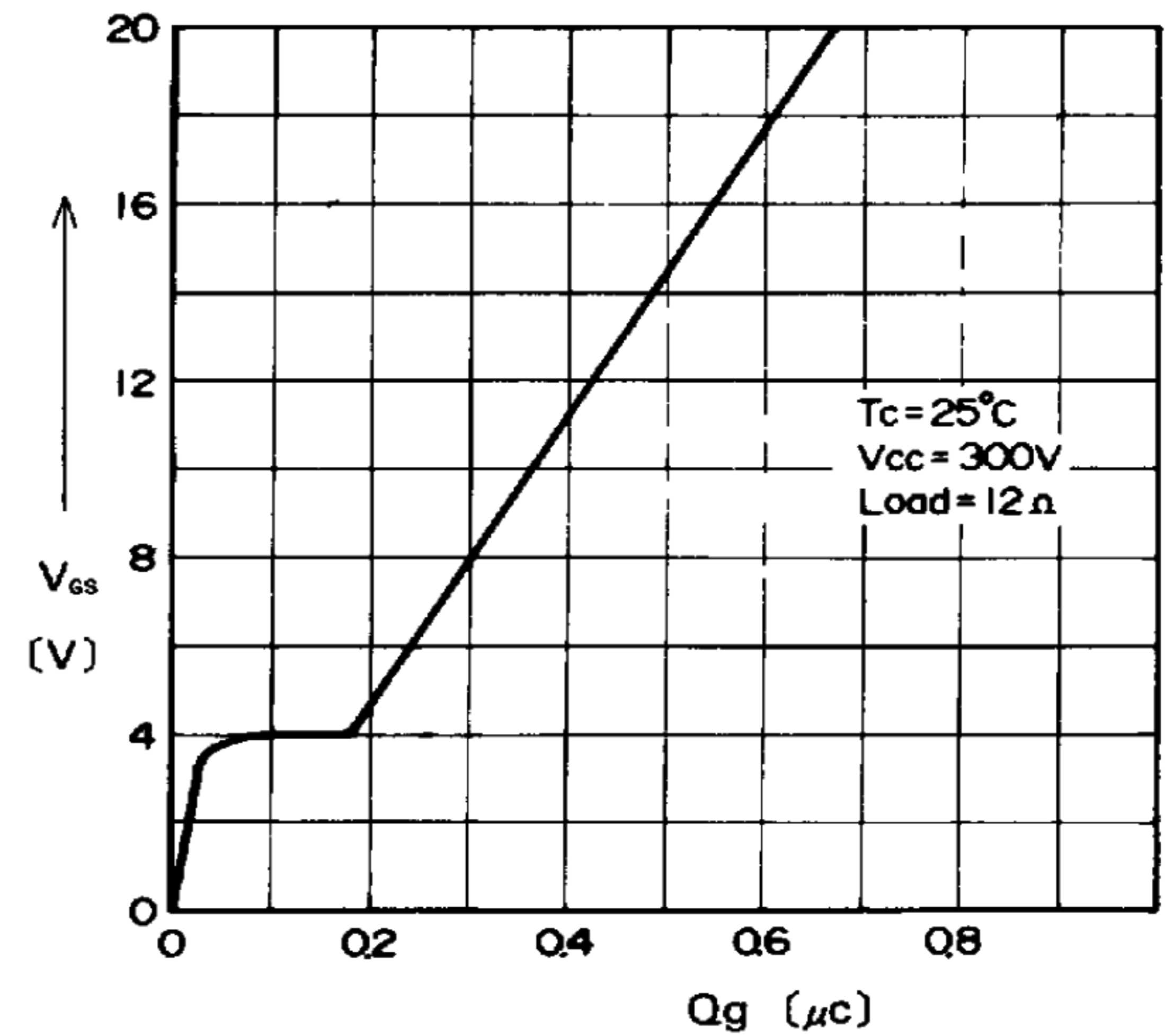
Reverse Recovery Characteristics



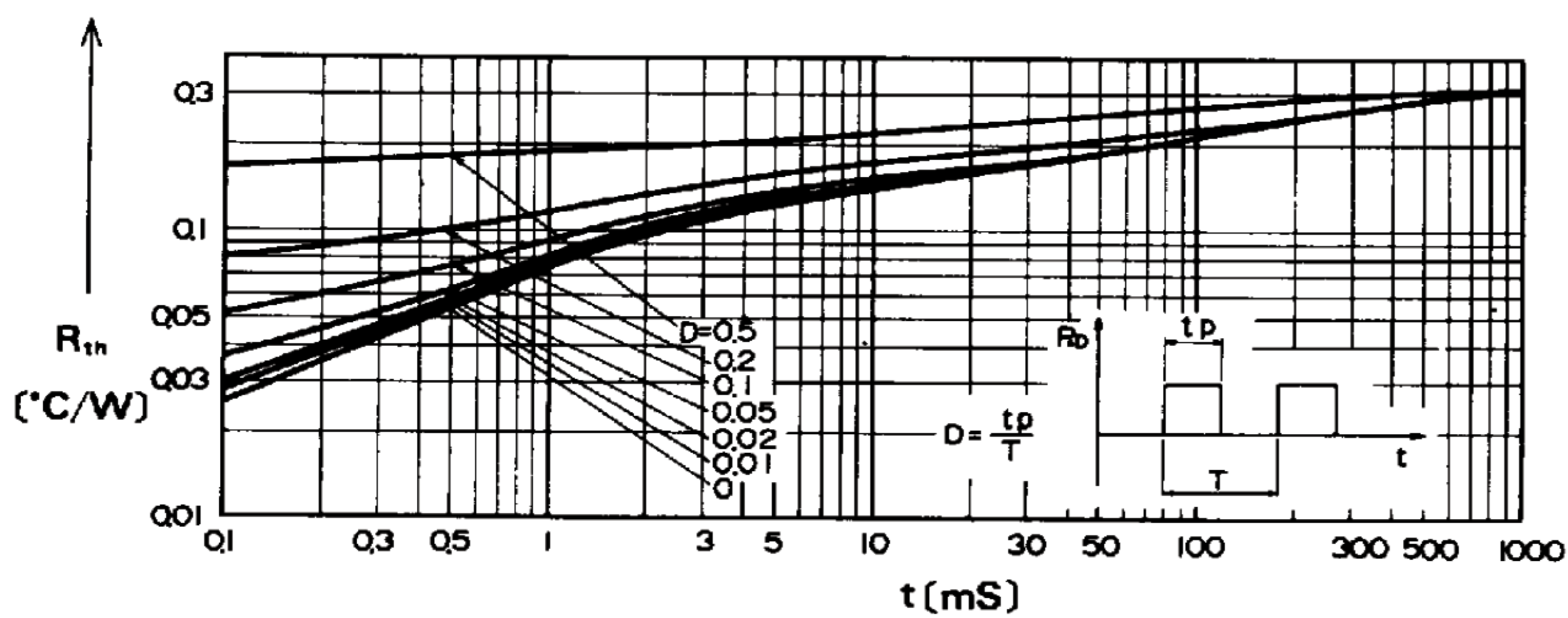
Max. Allowable  $di/dt$  at  $t_{off}$



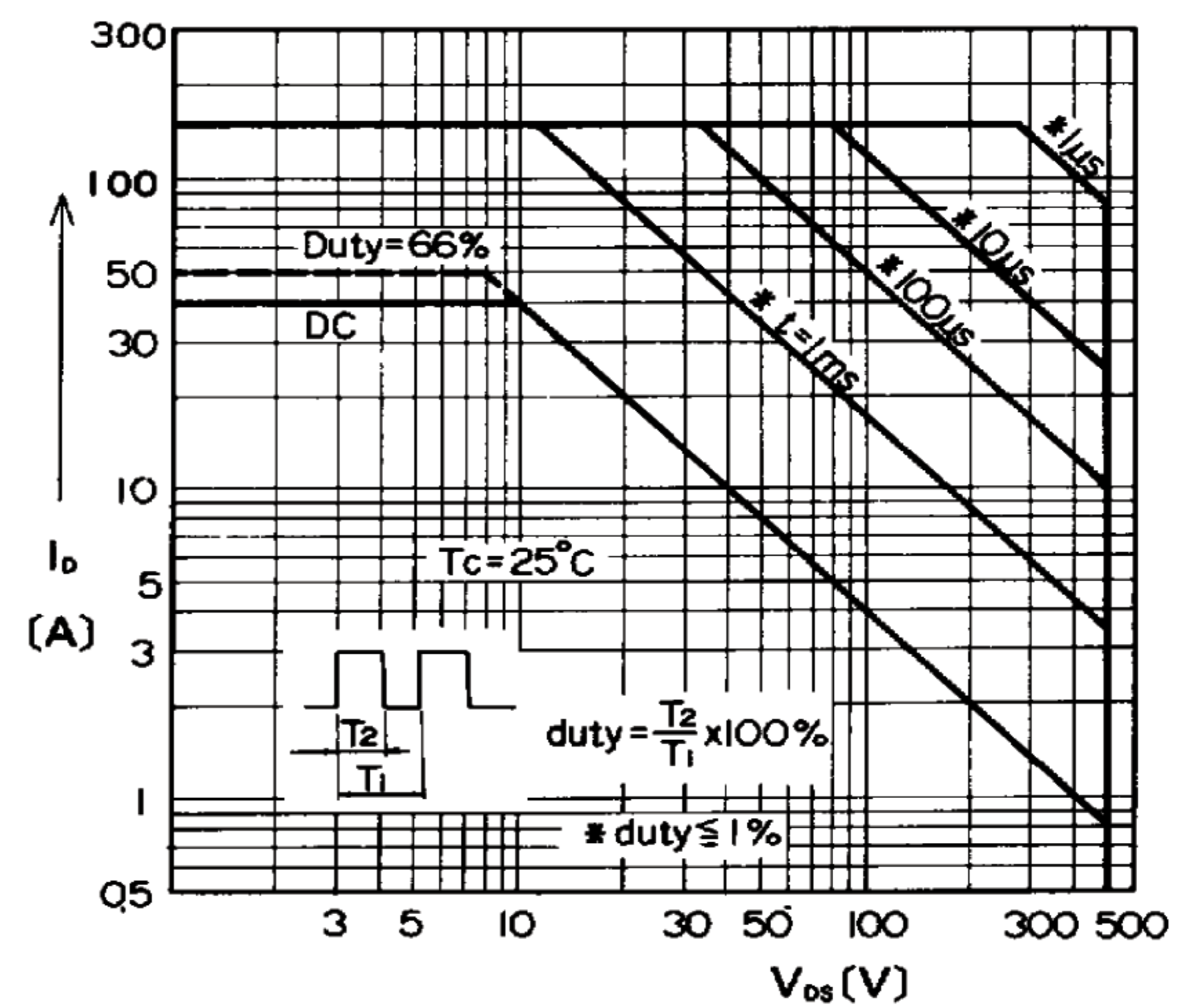
Forward Voltage of FWD



Typical Input Charge



Transient Thermal Impedance



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