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SPECIFICATION

Device Name : Intelligent Power MOSFET

Type Name : F 5 0 2 0

Spec. No. : **MS5F4291**

Fuji Electric Co., Ltd.
Matsumoto Factory

Fuji Electric Co., Ltd.

DATE	NAME	APPROVED	DWG. NO.
Apr - 2 - 1988	S. Suzuki	S. Suzuki	MS5F4291
Apr - 2 - '88	S. Furukata	S. Furukata	
CHECKED			

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1. Scope
This specifies Fuji Intelligent Power MOSFET F 5 0 2 0
2. Construction
Self-Isolation Structure
Output Part; N-channel enhancement mode power MOSFET
3. Application
For switching
4. Outview
K-pack (EIAJ SC-63) S-type (Outview See to 6/12 page)
5. Absolute maximum ratings (at $T_j=25^\circ\text{C}$, unless otherwise specified.)

Description	Symbol	Characteristics	Unit	Conditions
Drain-source voltage	V_{DSS}	4 0	V	DC
Gate-source voltage	V_{GSS}	DC - 0.3 ~ 7.0	V	DC
Continuous drain current	I_D	3	A	
Maximum power dissipation	P_D	1 0	W	
Operating junction temperature	T_j	1 5 0	$^\circ\text{C}$	————
Storage temperature range	T_{stg}	- 5 5 ~ 1 5 0	$^\circ\text{C}$	————

6. Electrical characteristics (at $T_j=25^\circ\text{C}$, unless otherwise specified.)

Description	Symbol	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Drain-source clamp voltage	V_{DSS}	$I_D = 1\text{ mA}$ $V_{GS} = 0\text{ V}$	4 0		6 0	V
Gate threshold voltage	$V_{GS(th)}$	$I_D = 10\text{ mA}$ $V_{DS} = 13\text{ V}$	1.0		2.8	V
Operation gate voltage	$V_{GS(op)}$		3.5		7.0	V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 30\text{ V}$ $V_{GS} = 0\text{ V}$			1.0	mA
Gate-source leakage current	$I_{GS(n)}$	* $V_{GS} = 5\text{ V}$			5 0 0	μA
	$I_{GS(un)}$		**		8 0 0	μA
Drain-source on-state resistance	$R_{DS(on)}$	$I_D = 5\text{ A}, V_{GS} = 5\text{ V}$			4 0 0	m Ω
		$I_D = 5\text{ A}, V_{GS} = 3\text{ V}$			6 0 0	

* Under normal operation ** Under self protection

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Description	Symbol	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Turn-on time	t_{on}	$V_{os} = 13\text{ V}$ $R_L = 2.6\text{ A}$			0.0	μS
Turn-off time	t_{off}	$V_{gs} = 5\text{ V}$			0.0	μS
Over-temperature protection	T_{trip}	$V_{gs} = 5\text{ V}$	5.0			
Short circuit protection	I_{oc}	$V_{gs} = 5\text{ V}$	5			A
Single pulse inductive load switch-off energy dissipation	E_{CL}	$I_D = 8\text{ A}$ $T_J = 150^\circ\text{C}$	100			mJ

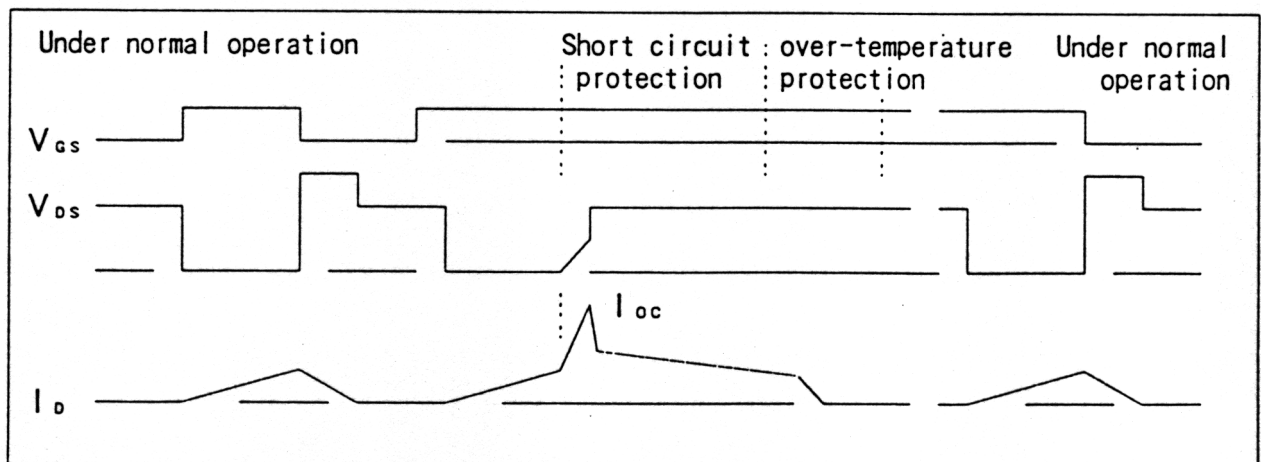
7. Thermal resistance

Description	Symbol	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Thermal resistance	$R_{th(j-c)}$	Junction-case			12.5	$^\circ\text{C/W}$
Thermal resistance	$R_{th(j-a)}$	Junction-ambient *			12.5	$^\circ\text{C/W}$

8. Electrostatic discharge

Description	Conditions	Characteristics			Unit
		Min.	Typ.	Max.	
Drain-source	150 pF, 150 Ω	± 1.5			kV
Gate-source		± 0.5			kV

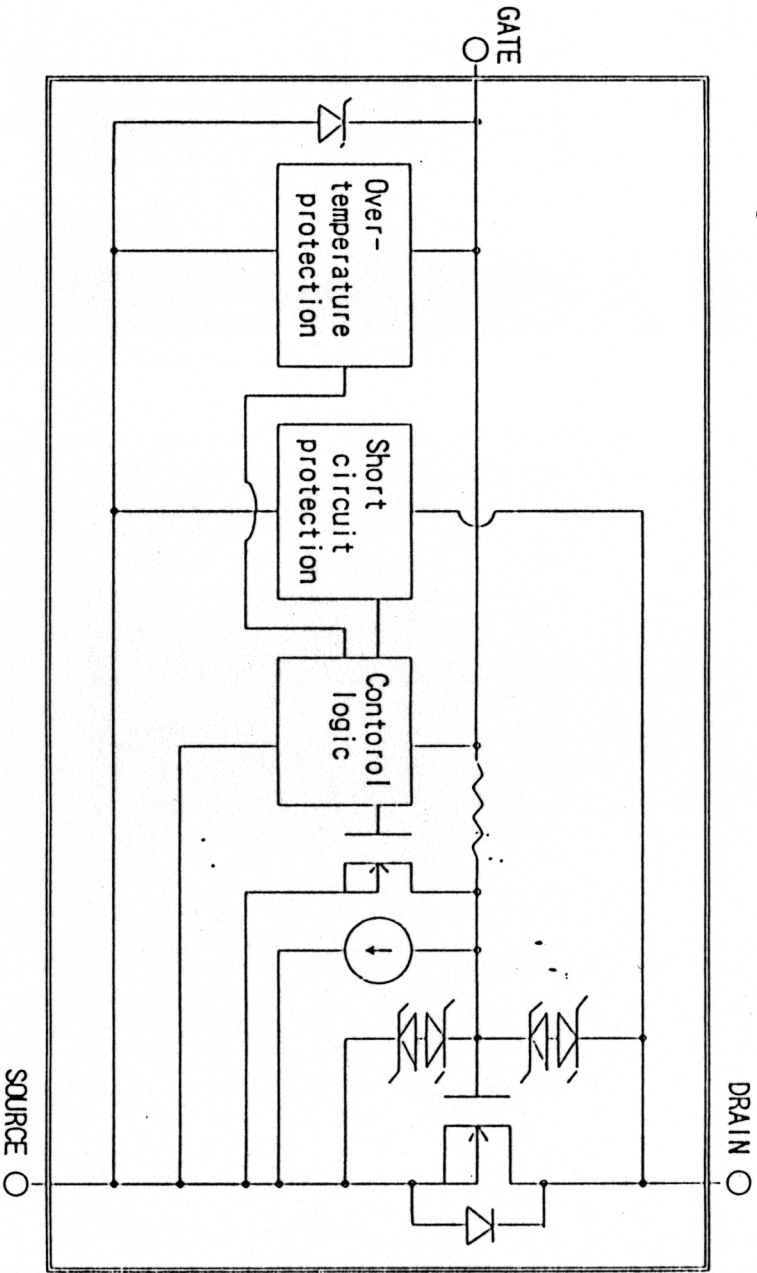
9. Timing chart



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1 0. Block diagram



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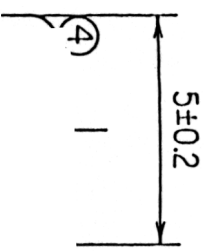
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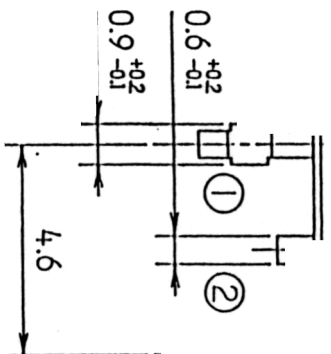
MOSFET Type : F5020

OUT VIEW

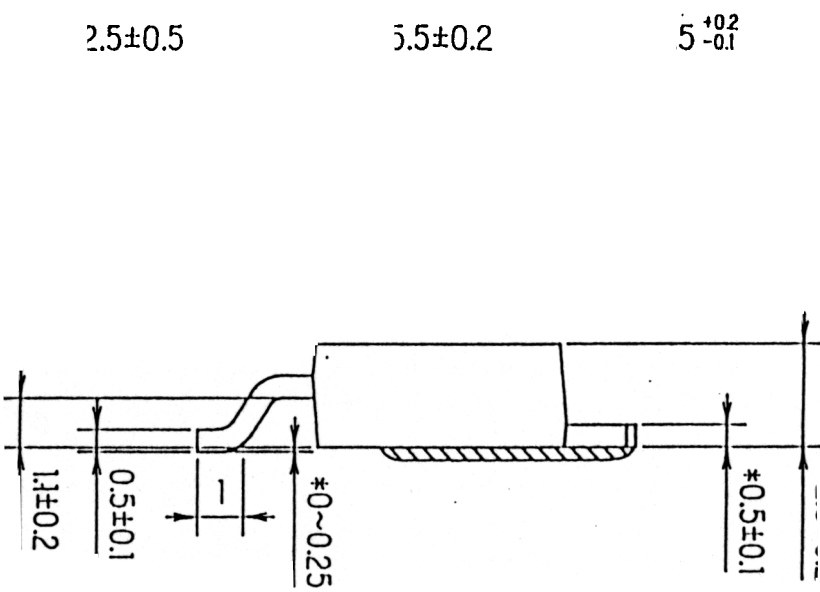


Type name

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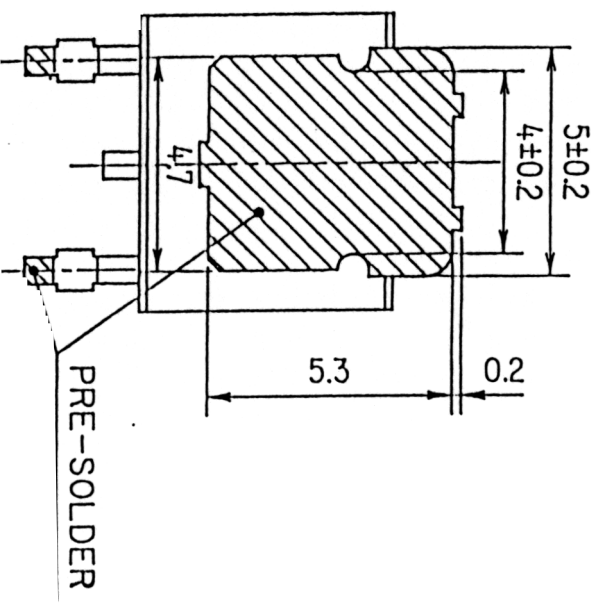


BACK VIEW



④ DRAIN
SOURCE

F1A1J:SC-63

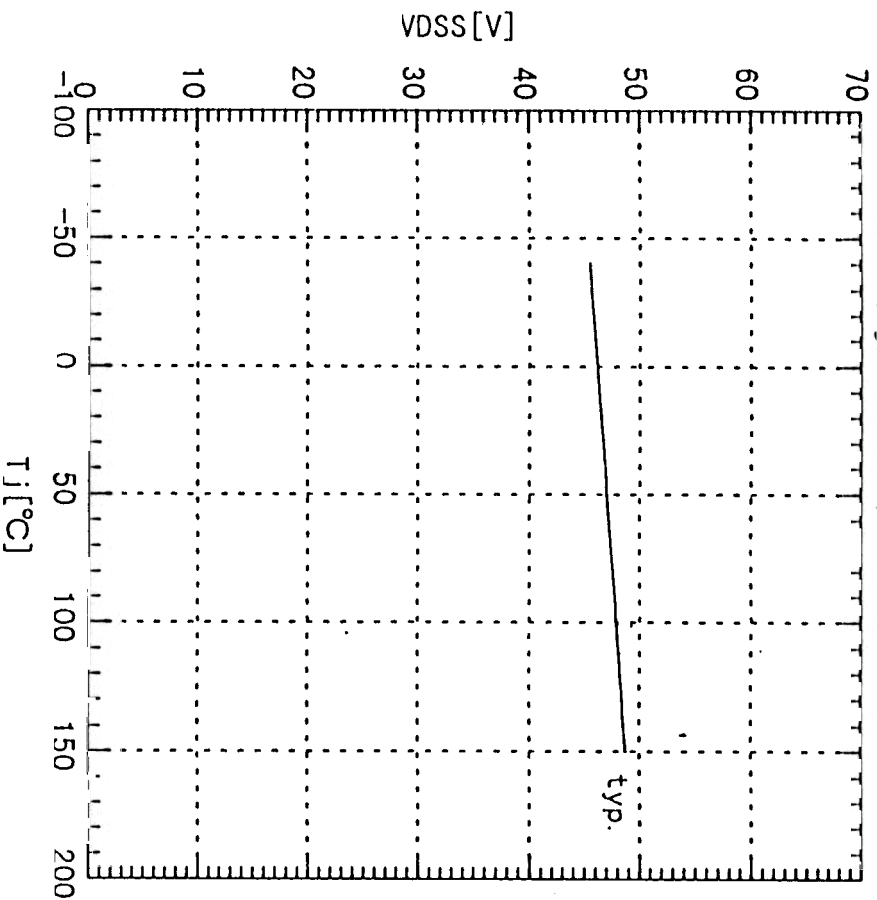


Dimension of * marks are excluded the thickness solder.

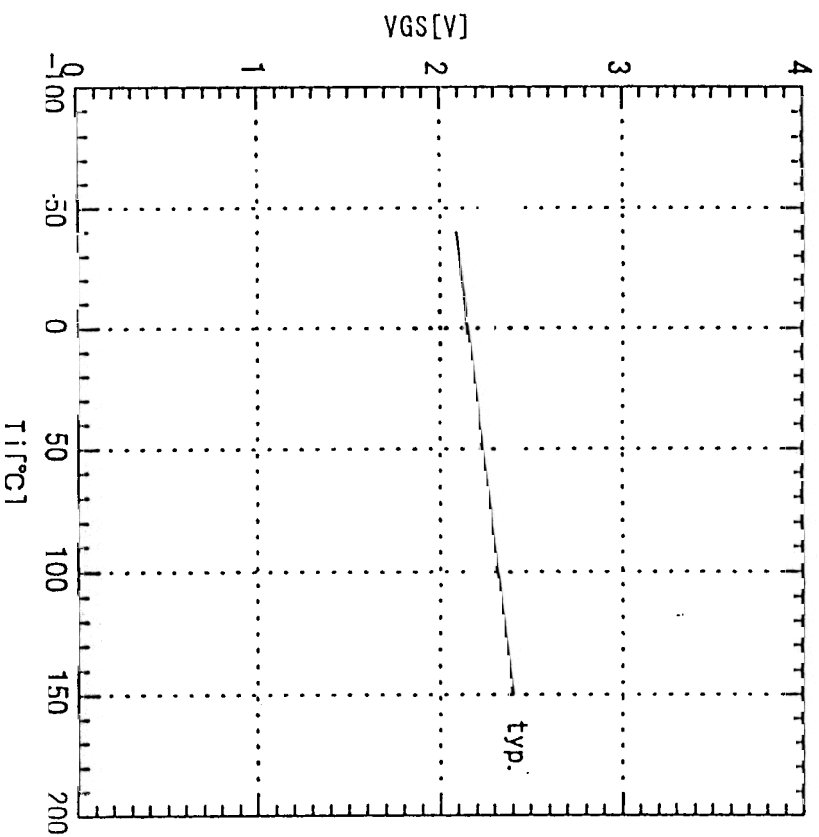
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Drain-source breakdown voltage
 $V_{DSS}=f(T_j) : I_D=1\text{mA}, V_{GS}=0\text{V}$



Gate threshold voltage
 $V_{GS}=f(T_j) : V_{DS}=13\text{V}, I_D=10\text{mA}$



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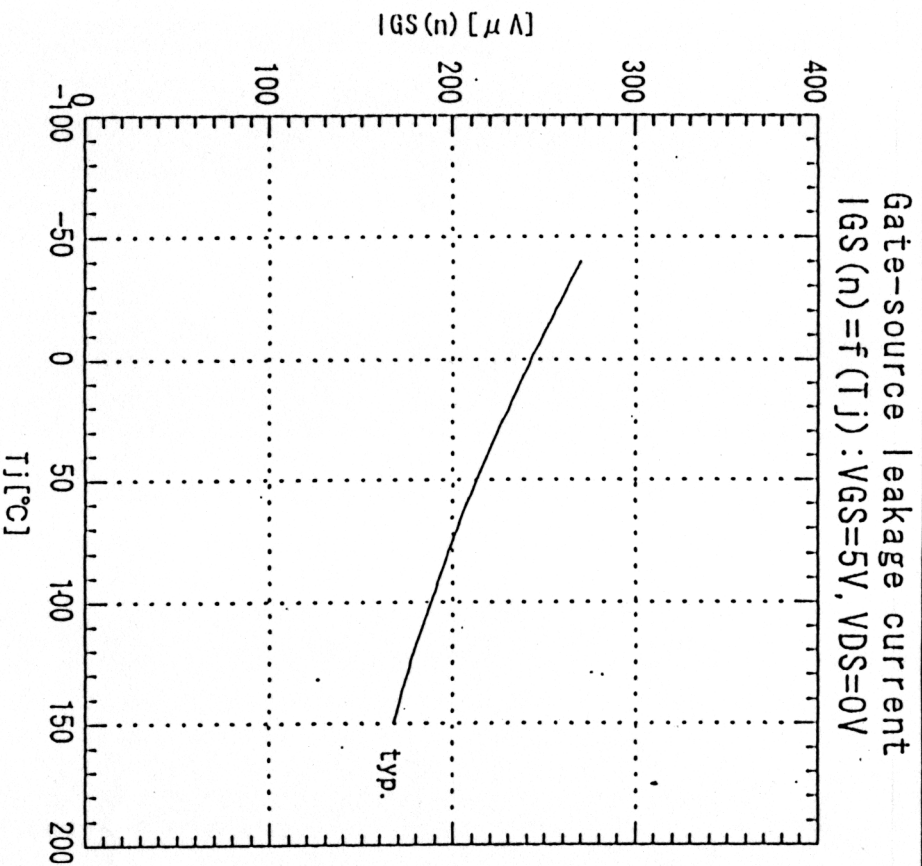
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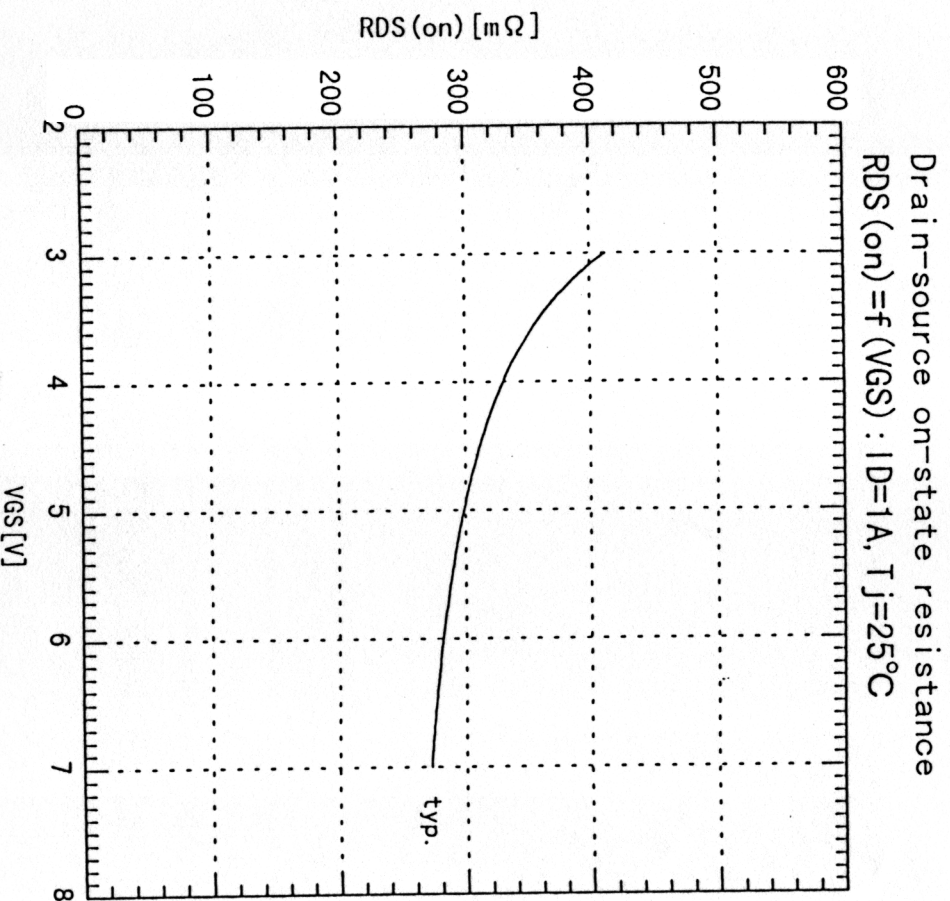
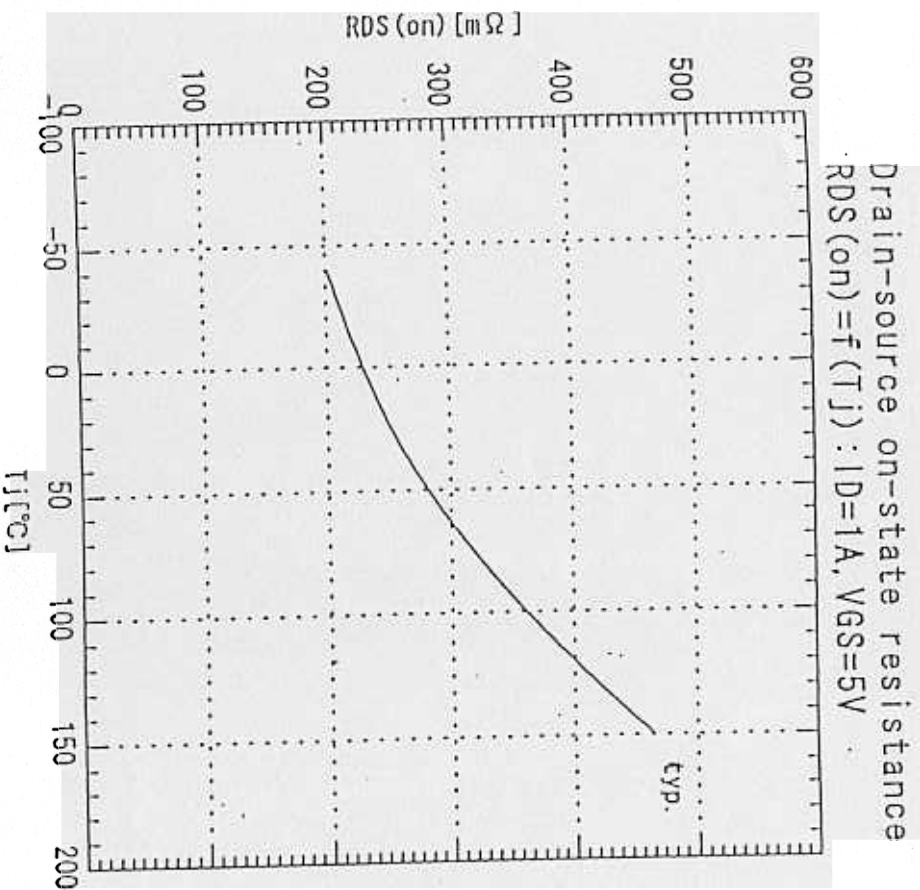
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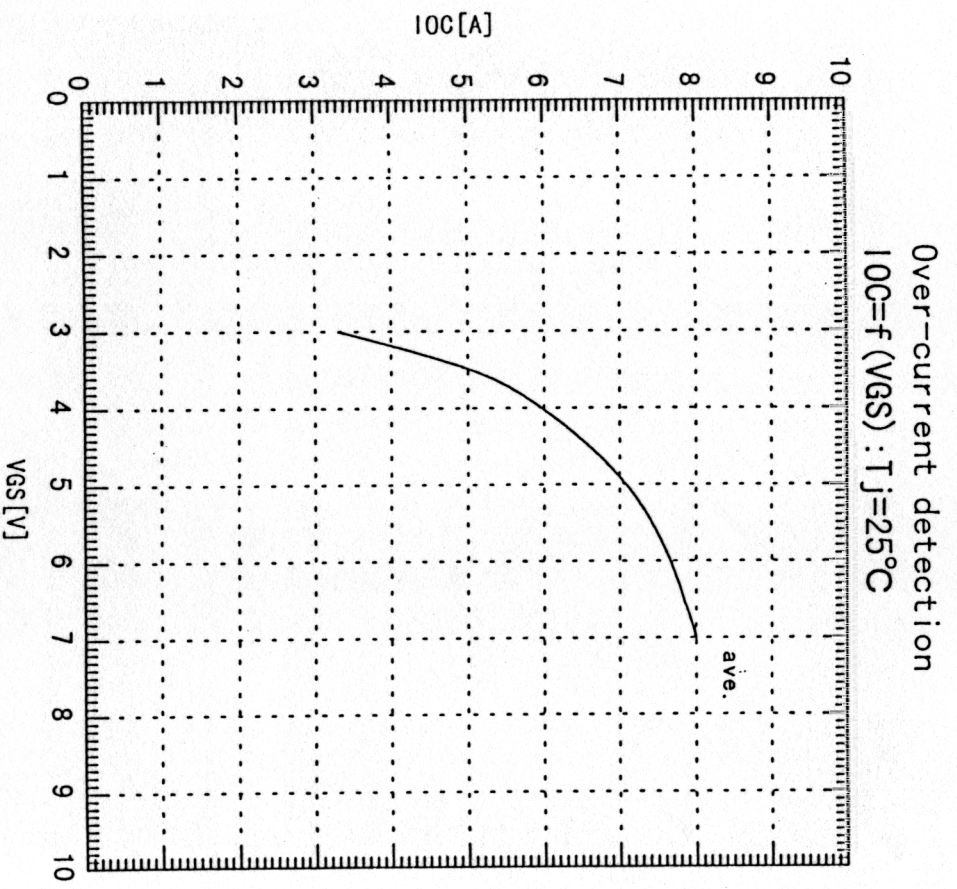
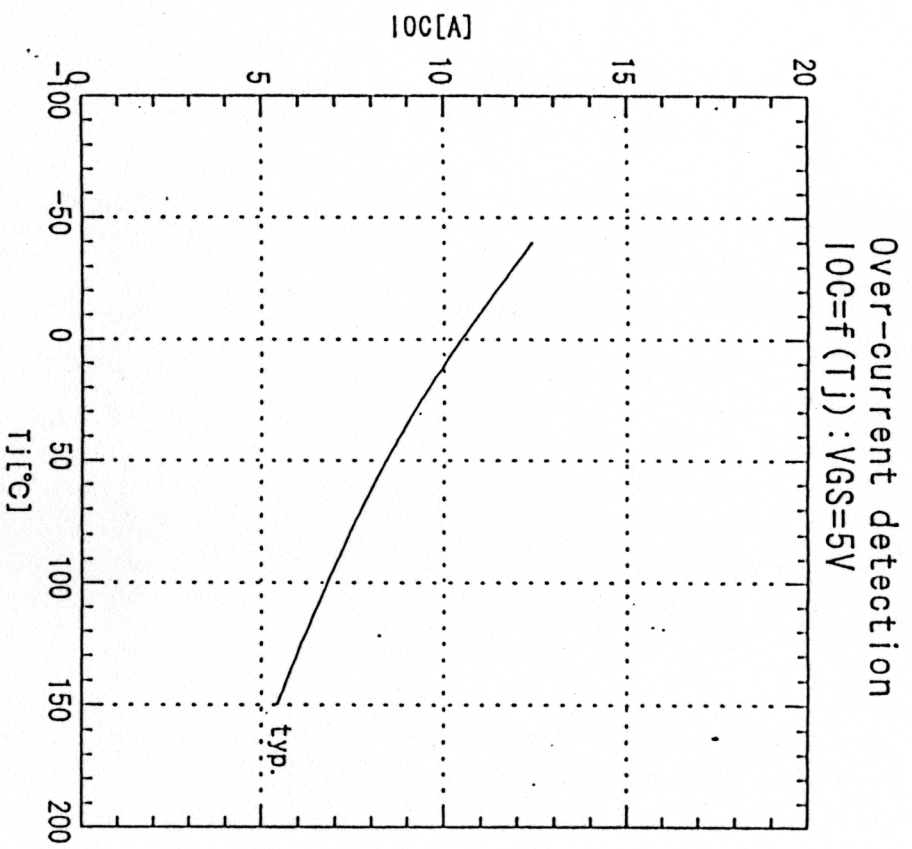
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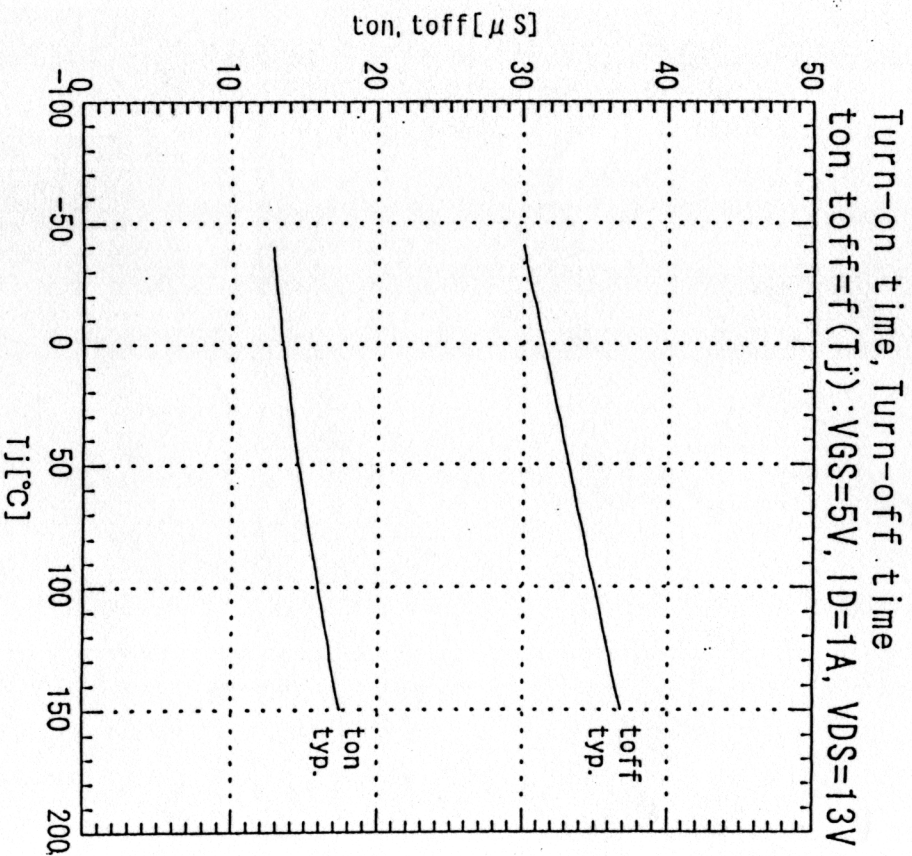
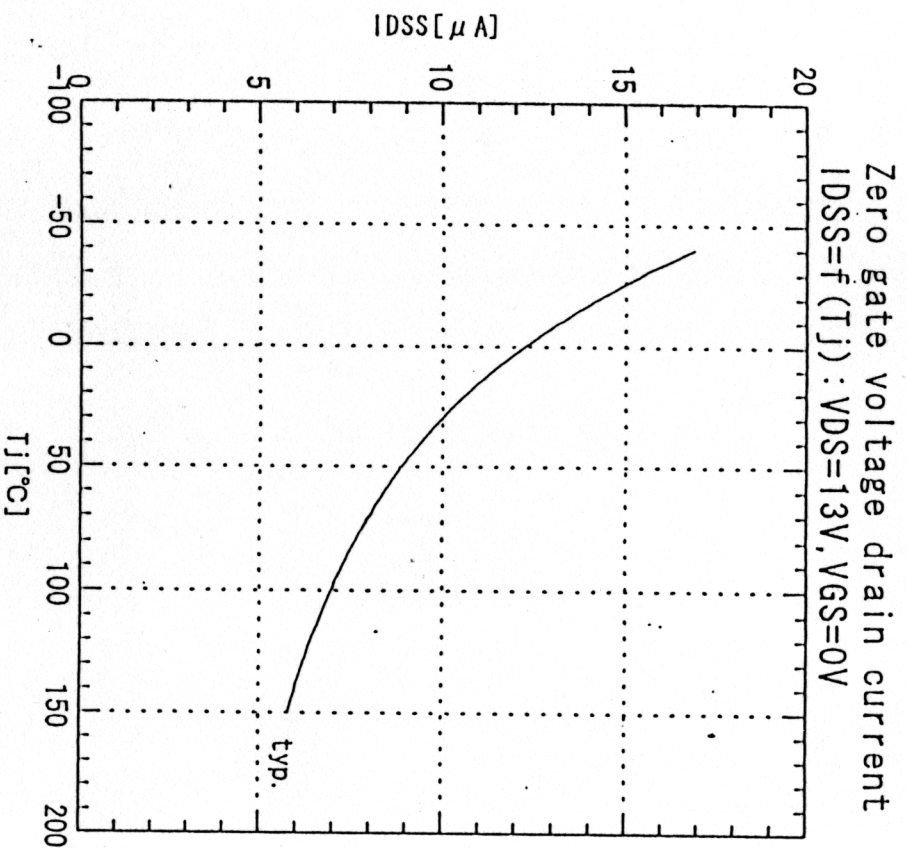
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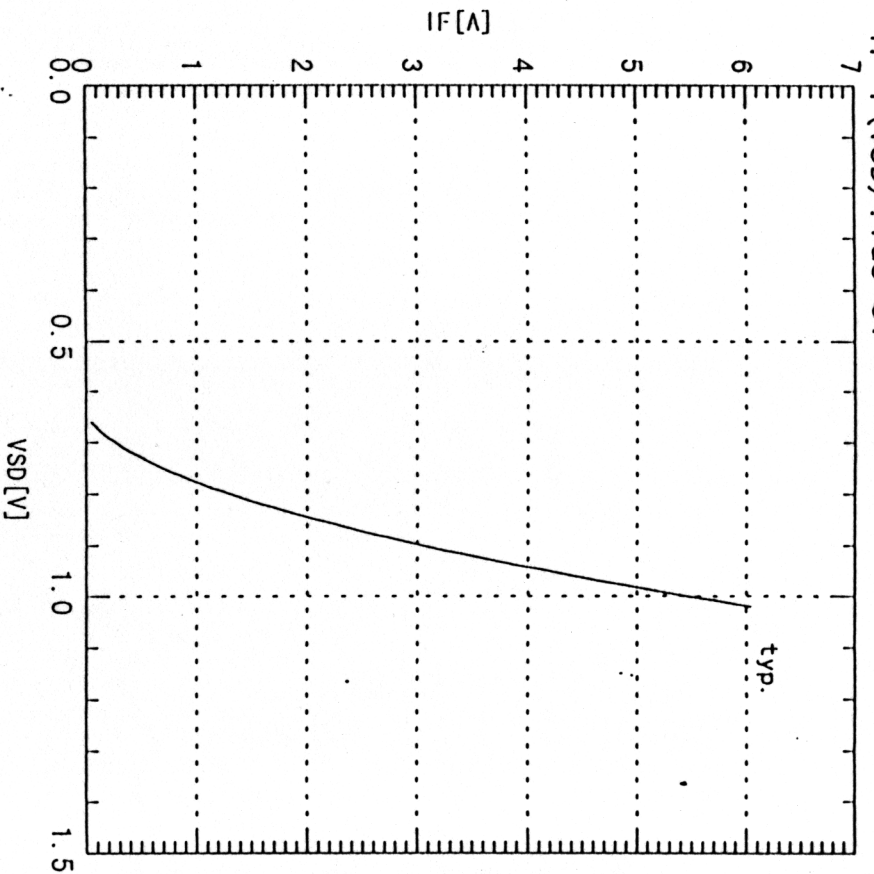


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Forward characteristic of reverse of diode
 $I_F = f(V_{SD}) : V_{GS} = 0V$



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