SPECIFICATION

Device Name : Intelligent Power MOSFET

Type Name : F5019-S

Spec. No. : MS5F4286

Fuji Electric Co.,Ltd.
Matsumoto Factory

	DATE	NAME	APPROVED
DRAWN	March-19-1998	S.Kiuchi	
CHECKED	March-19-1998	S.Furuhata	

Fuji Electric Co.,Ltd.

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Revised Records

Date	Classi-fication	Ind.	Content	Applied date	Drawn	Checked	Approved
March-19-1998	enactment	——	————	Issued date	——	S. Furukata	T. Sato
Feb-25-1999	change	a	6/13 page Outview Lot. No. 4→5 figures	Feb-25-1999	S. Kikuchi	S. Furukata	S. Furukata

1. Scope
   This specifies Fuji Intelligent Power MOSFET　F 5 0 1 9 − S

2. Construction
   Self-Isolation Structure
   Output Part; N-channel enhancement mode power MOSFET

3. Application
   For switching

4. Outview
   T pack S-type.　(See to 6/13 page)

5. Absolute maximum ratings　(at Tj=25℃, unless otherwise specified.)

Description	Symbol	Characteristics	Unit	Conditions
Drain-source voltage	V_{DSS}	4 0	V	D C
Gate-source voltage	V_{GSS}	D C − 0. 3 ～ 7. 0	V	D C
Continuous drain current	I_D	1 2	A	T c = 2 5 ℃
Maximum power dissipation	P_D	3 0	W	T c = 2 5 ℃
Operating junction temperature	T_j	1 5 0	℃	———
Storage temperature range	T_{stg}	− 5 5 ～ 1 5 0	℃	———

6. Electrical characteristics　(at Tj=25 ℃, unless otherwise specified.)

Description	Symbol	Conditions		Characteristics Min.	Typ.	Max.	Unit
Drain-source clamp voltage	V_{DSS}	I_D = 1 mA, V_{GS} = 0 V		4 0		6 0	V
Gate threshold voltage	$V_{GS(th)}$	I_D = 1 0 mA, V_{DS} = 1 3 V		1. 0		2. 8	V
Operation gate voltage	$V_{GS(p)}$			3. 5		7. 0	V
Zero gate voltage drain current	I_{DSS}	V_{DS} = 3 0 V, V_{GS} = 0 V				1. 0	mA
Gate-source leakage current	$I_{GS(n)}$	*	V_{GS} = 5 V			5 0 0	μA
	$I_{GS(un)}$	**				8 0 0	μA
Drain-source on-state resistance	$R_{DS(on)}$	I_D = 5 A, V_{GS} = 5 V				1 4 0	mΩ
Forward on voltage	V_{SD}	I_F = 2 4 A				2. 0	V

* Under normal operation　** Under self protection

Description	Symbol	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Turn-on time	t_{on}	V_{DS} = 1 3 V R_L = 2.6 Ω V_{GS} = 5 V			2 0 0	μS
Turn-off time	t_{off}				2 0 0	μS
Over-temperature protection	T_{trip}	V_{GS} = 5 V	1 5 0		2 1 0	℃
Short circuit protection	I_{oc}	V_{GS} = 5 V	1 2		3 2	A
Single pulse inductive load switch-off energy dissipation	E_{CL}	I_D = 8 A T_J = 1 5 0℃	1 0 0			m j

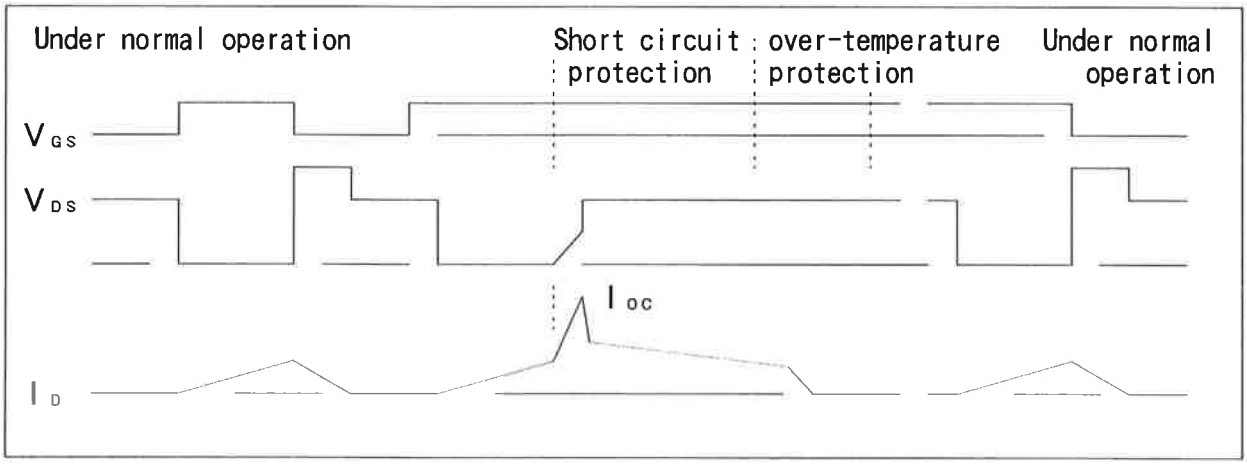
7. Thermal resistance

Description	Symbol	Conditions	Characteristics			Unit
			Min.	Typ.	Max.	
Thermal resistance	$Rth_{(j-c)}$	Junction-case			4.2	℃/W
	$Rth_{(j-a)}$	Junction-ambient			1 0 0	℃/W

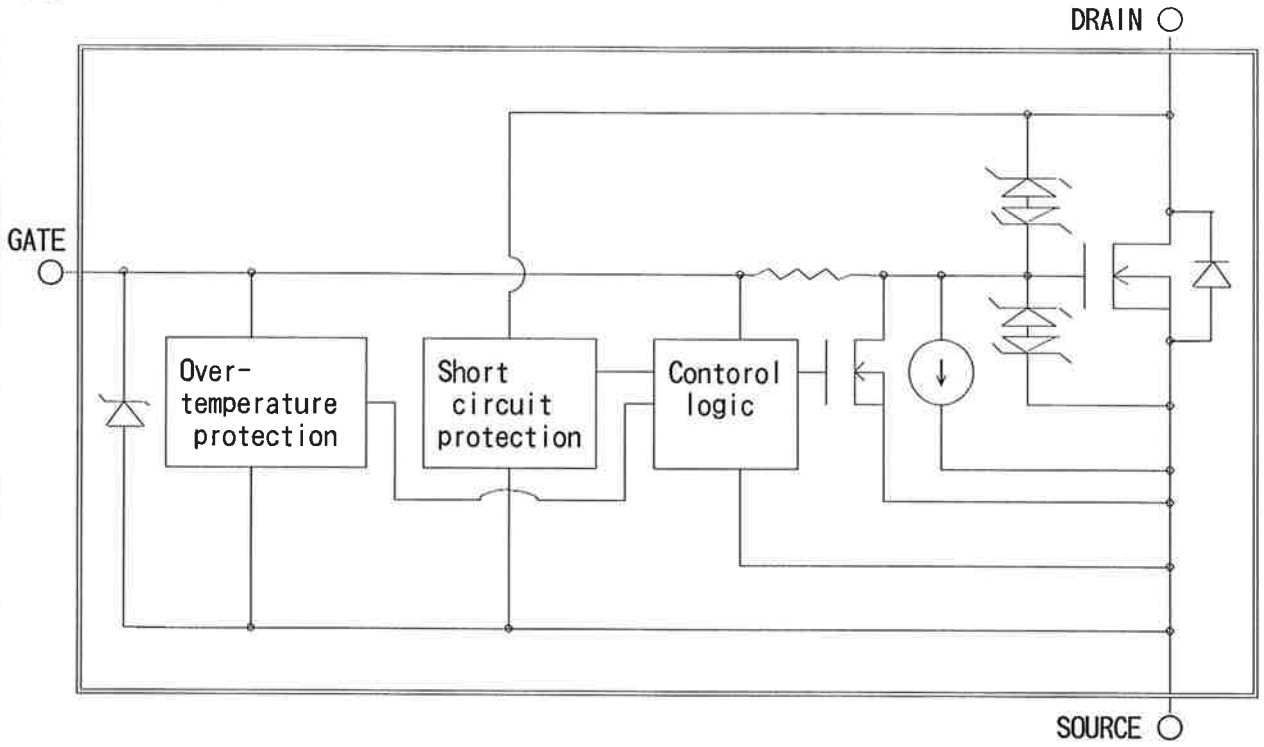
8. Electrostatic discharge

Description	Conditions	Characteristics			Unit
		Min.	Typ.	Max.	
Drain-source	1 5 0 p F, 1 5 0 Ω	± 1 5			k V
Gate-source		± 0.5			k V

9. Timing chart

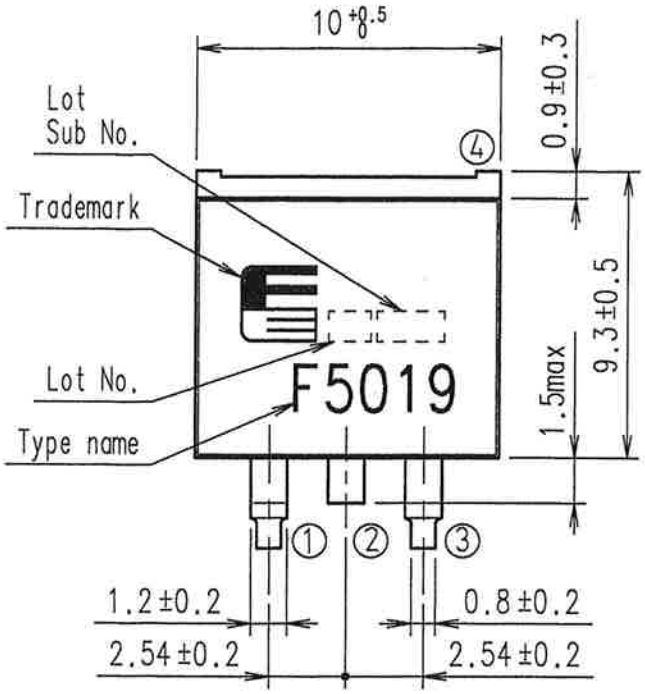


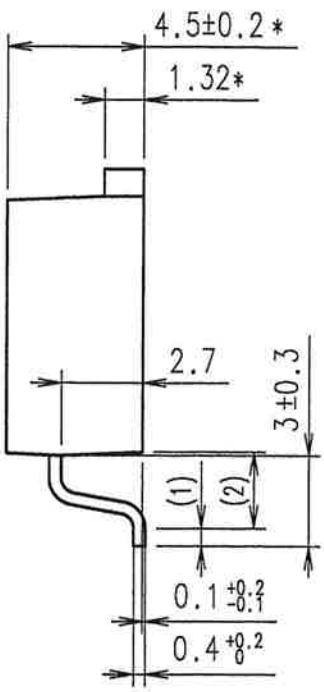
1 0. Block diagram



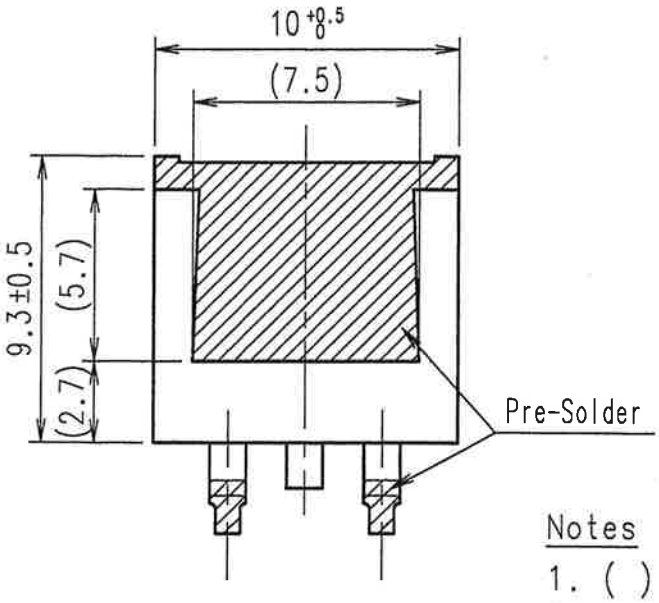
FUJI INTELLIGENT POWER MOS FET

TYPE : F5019-S





BOTTOM VIEW



CONNECTION

① GATE
④ ② DRAIN
③ SOURCE

Notes

1. ( ) : REFERENCE DIMENSIONS.
2. * : DO NOT INCLUDE SOLDER.

DIMENSIONS ARE IN MILLIMETERS. ⓐ

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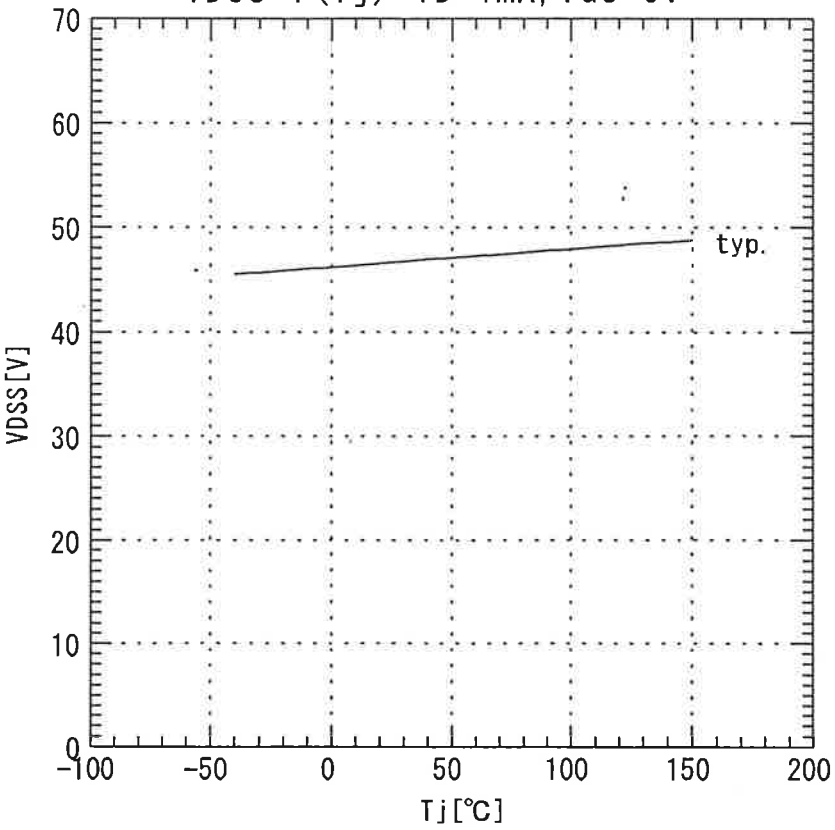
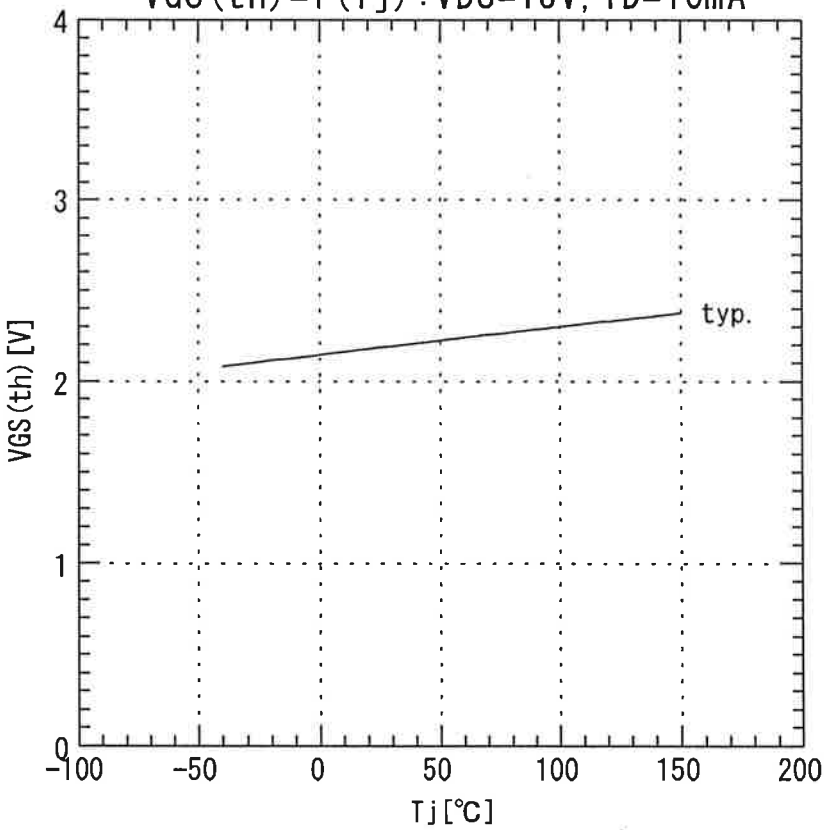
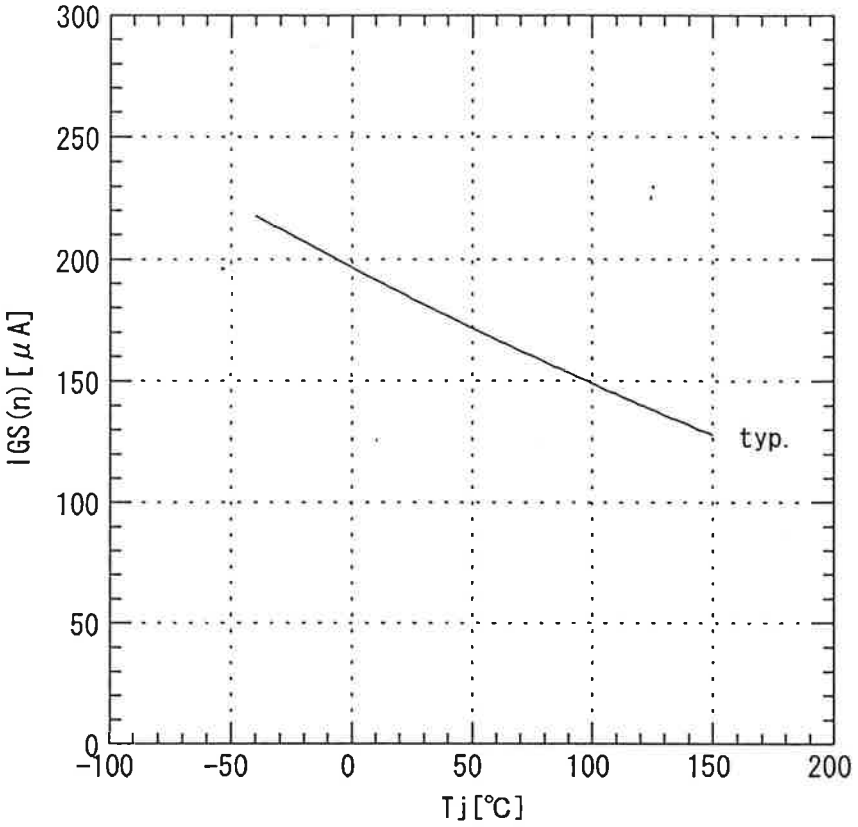
Drain-source clamp voltage
VDSS=f(Tj) : ID=1mA, VGS=0V



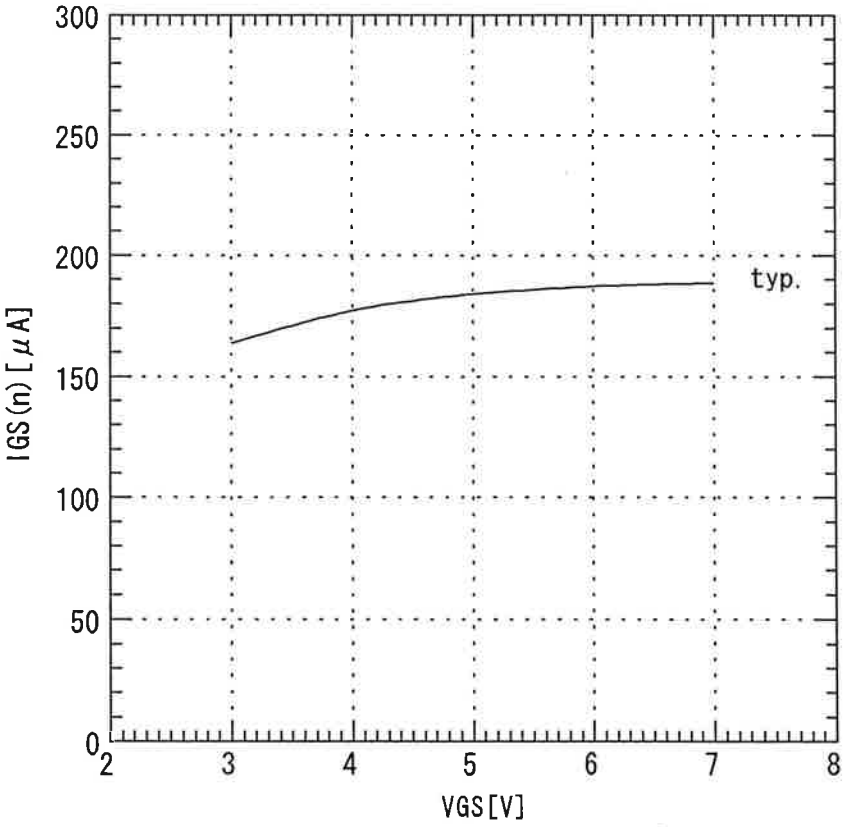
Gate threshold voltage
VGS(th)=f(Tj) : VDS=13V, ID=10mA



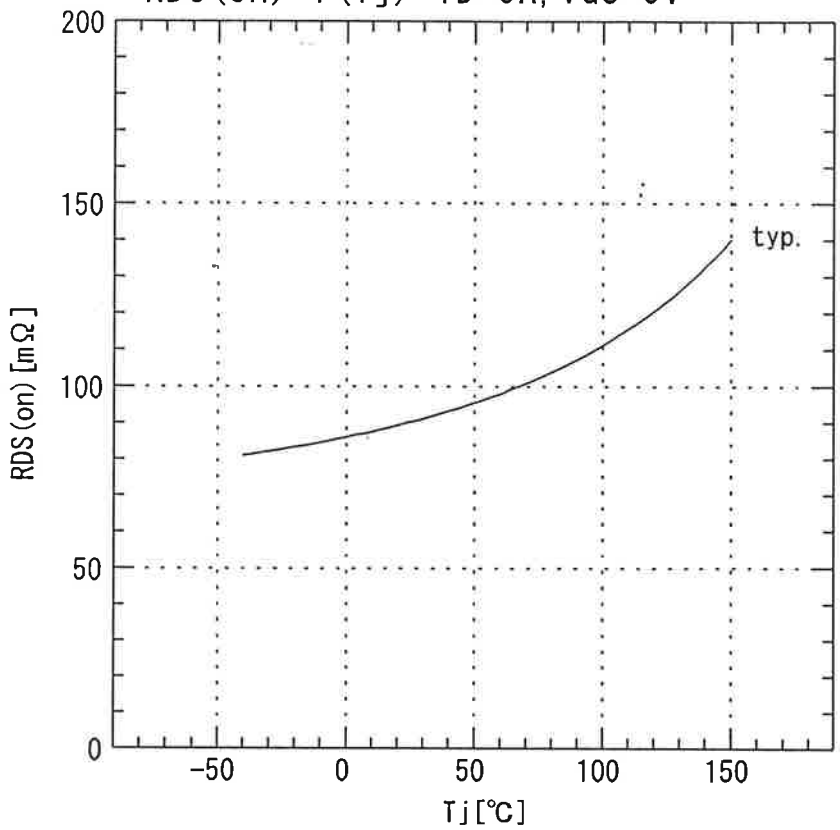
Gate-source leakage current
IGS(n)=f(Tj) : VGS=5V, VDS=0V



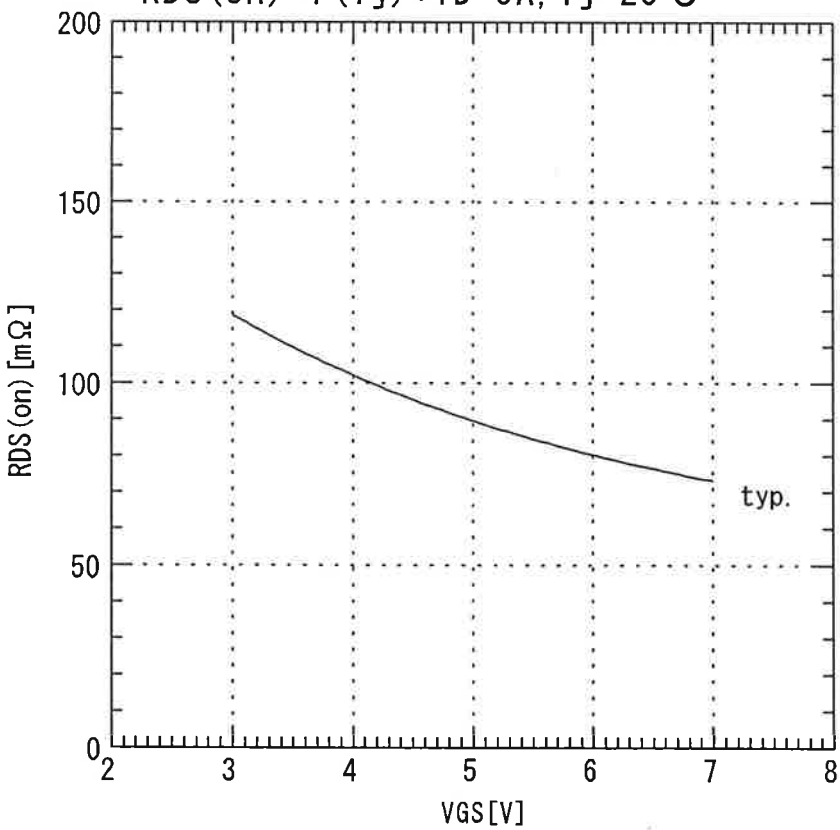
Gate-source leakage current
IGS(n)=f(VGS) : Tj=25℃, VDS=0V



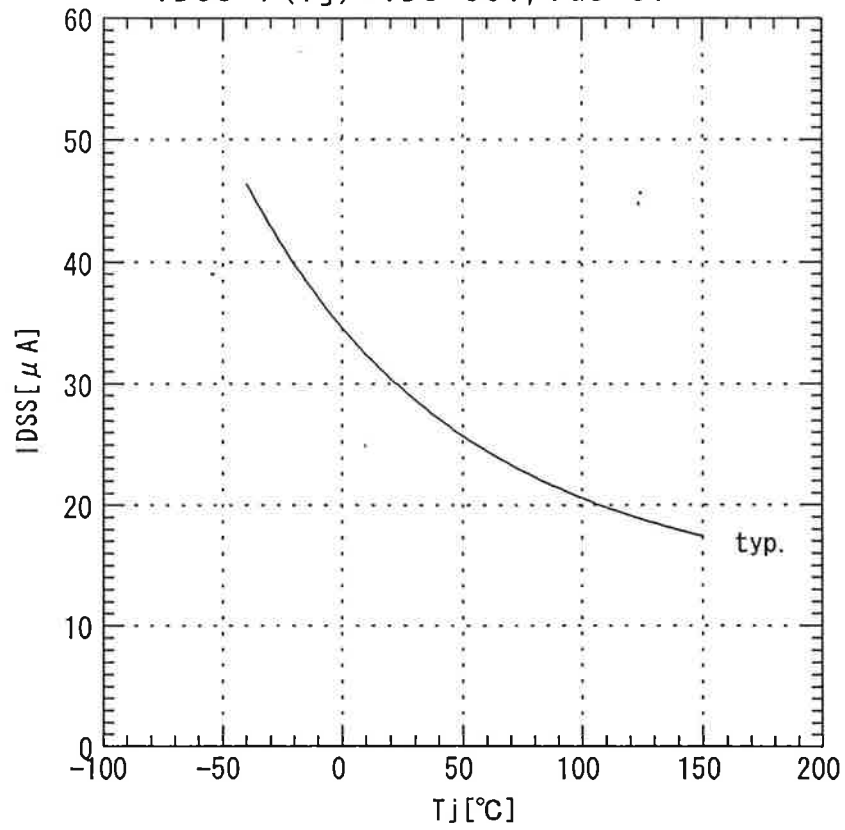
Drain-source on-state resistance
RDS(on)=f(Tj) : ID=5A, VGS=5V



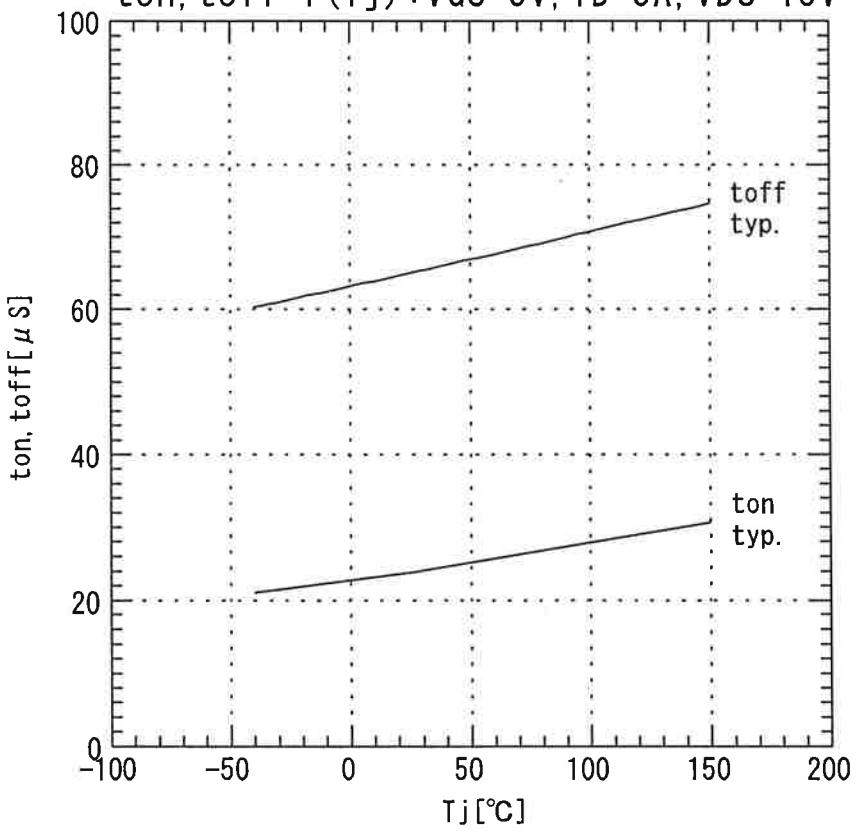
Drain-source on-state resistance
RDS(on)=f(Tj) : ID=5A, Tj=25℃



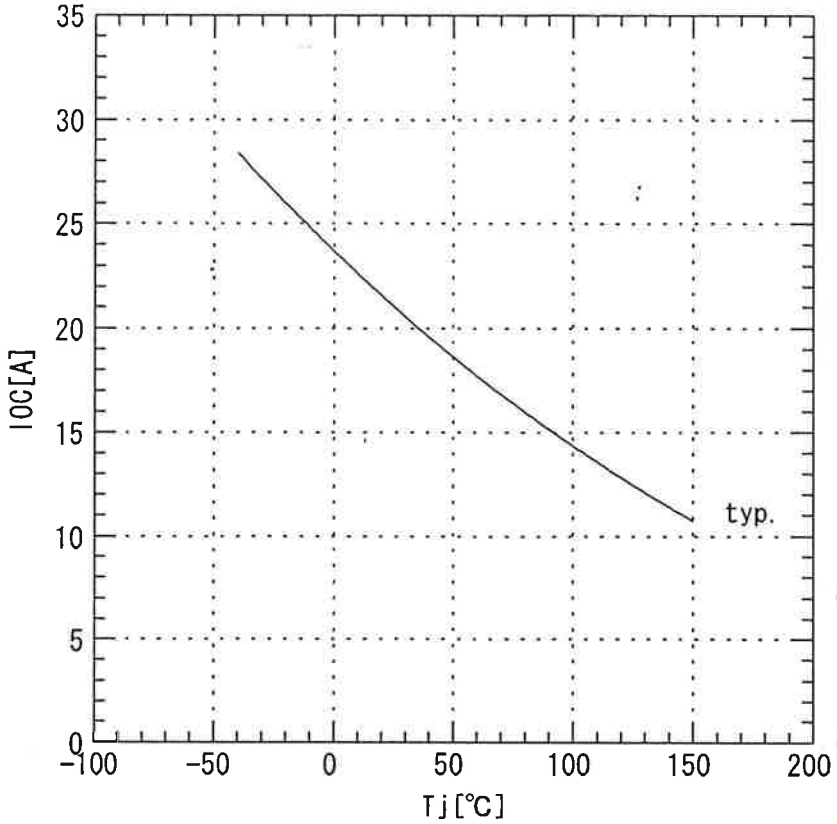
Zero gate voltage drain current
IDSS=f(Tj):VDS=30V, VGS=0V



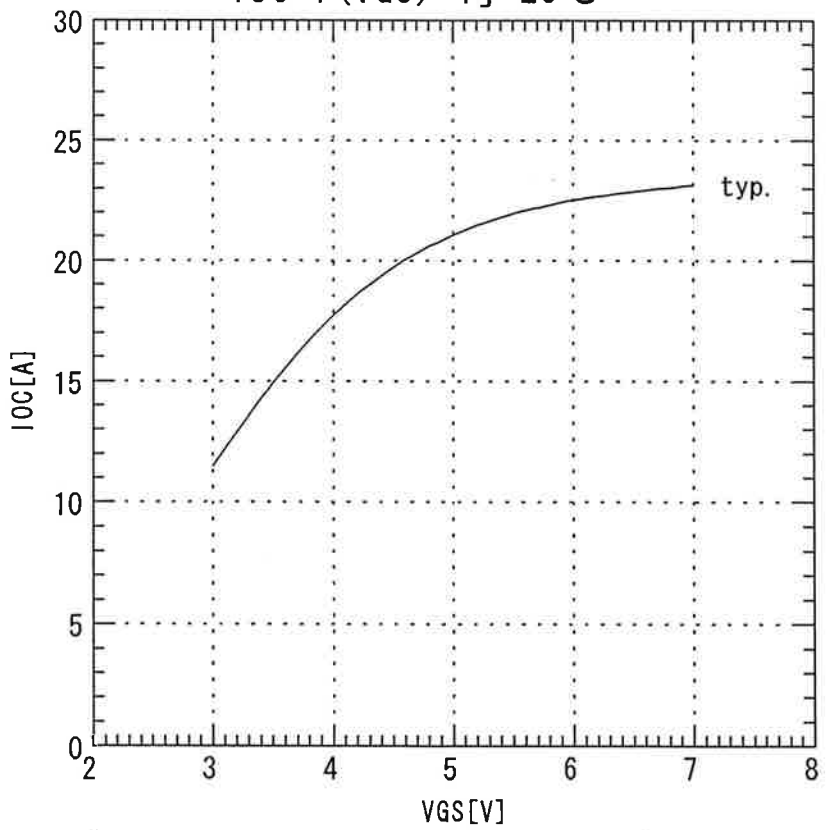
Turn-on time, Turn-off time
ton, toff=f(Tj):VGS=5V, ID=5A, VDS=13V



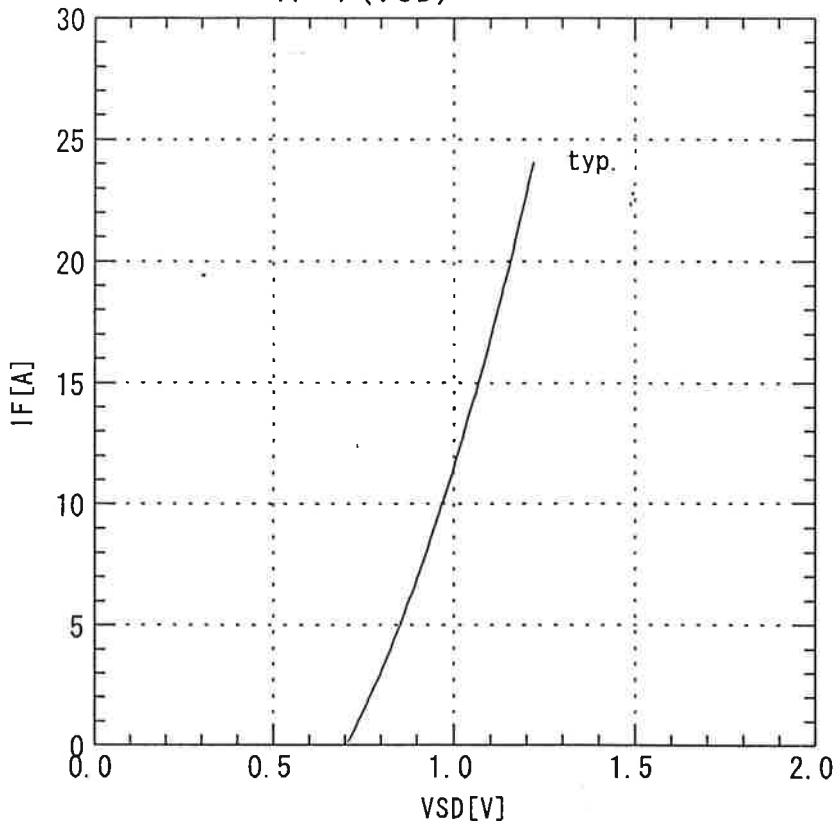
Short circuit detection
IOC=f(Tj) : VGS=5V



Short circuit detection
IOC=f(VGS) : Tj=25℃

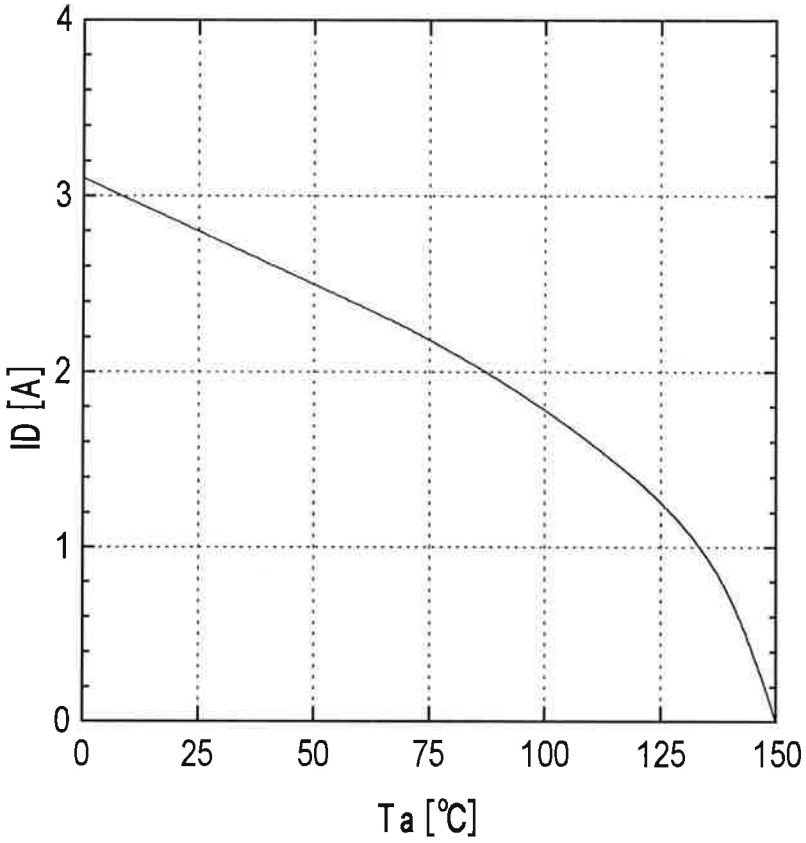


Forward on voltage
IF=f(VSD)



Continuous Drain Current VS Ambient Temperature

ID=f(Ta) :Mounting Pad Size(a)=10mm



Mounting Pad Size VS Drain Current Ratio

Drain Current Ratio=f(Maunting Pad Size)