

# SPECIFICATION

(TENTATIVE)

Device Name : Power MOSFET

Type Name : 2SK2891-01

Spec. No. :

This material and the information herein is the property of Fuji Electric Co.,Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party nor used for the manufacturing purposes without the express written consent of Fuji Electric Co.,Ltd.

Fuji Electric Co.,Ltd.  
Matsumoto Factory

	DATE	NAME	APPROVED	Fuji Electric Co.,Ltd.	
DRAWN				DWG. NO.	1 / 13
CHECKED					

H04-004-07

This material and the information herein is the property of Fuji Electric Co., Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party nor used for the manufacturing purposes without the express written consent of Fuji Electric Co., Ltd.

- 1.Scope** This specifies Fuji Power MOSFET 2SK2891-01
- 2.Construction** N-Channel enhancement mode power MOSFET
- 3.Applications** for Switching
- 4.Outview** TO-3P Outview See to 5/13 page

**5.Absolute Maximum Ratings at Tc=25°C (unless otherwise specified)**

Description	Symbol	Characteristics	Unit	Remarks
Drain-Source Voltage	V <sub>DS</sub>	30	V	
Continuous Drain Current	I <sub>D</sub>	±100	A	
Pulsed Drain Current	I <sub>DP</sub>	±400	A	
Gate-Source Voltage	V <sub>GS</sub>	±16	V	
Maximum Avalanche Energy	E <sub>AV</sub>	1555.6	mJ	*1
Maximum Power Dissipation	P <sub>D</sub>	125	W	
Operating and Storage	T <sub>ch</sub>	150	°C	
Temperature range	T <sub>stg</sub>	-55 to +150	°C	

\*1 L=0.207mH, V<sub>CC</sub>=12V

**6.Electrical Characteristics at Tc=25°C (unless otherwise specified)**

**Static Ratings**

Description	Symbol	Conditions	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> =1mA V <sub>GS</sub> =0V	30			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	I <sub>D</sub> =1mA V <sub>DS</sub> =V <sub>GS</sub>	1.0	1.5	2.0	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =30V V <sub>GS</sub> =0V	T <sub>ch</sub> =25°C	10	500	μA
			T <sub>ch</sub> =125°C	0.2	1.0	mA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±16V V <sub>DS</sub> =0V		10	100	nA
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	I <sub>D</sub> =50A	V <sub>GS</sub> =4V	7.0	9.5	mΩ
			V <sub>GS</sub> =10V	4.4	5.5	

This material and the information herein is the property of Fuji Electric Co.,Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party nor used for the manufacturing purposes without the express written consent of Fuji Electric Co.,Ltd.

### Dynamic Ratings

Description	Symbol	Conditions	min.	typ.	max.	Unit
Forward Transconductance	$g_{fs}$	$I_b=50A$ $V_{DS}=25V$	35	70		S
Input Capacitance	$C_{iss}$	$V_{DS}=25V$ $V_{GS}=0V$ $f=1MHz$		3900	5850	pF
Output Capacitance	$C_{oss}$			2000	3000	
Reverse Transfer Capacitance	$C_{rss}$			850	1280	
Turn-On Time	$t_{d(on)}$	$V_{cc}=15V$		17	30	ns
	$t_r$	$V_{GS}=10V$		70	110	
Turn-Off Time	$t_{d(off)}$	$I_b=100A$		250	380	
	$t_f$	$R_{GS}=10\Omega$		180	270	

### Reverse Diode

Description	Symbol	Conditions	min.	typ.	max.	Unit
Avalanche Capability	$I_{AV}$	$L=100\mu H$ $T_{ch}=25^\circ C$ See Fig.1 and Fig.2	100			A
Diode Forward On-Voltage	$V_{SD}$	$I_F=50A$ $V_{GS}=0V$ $T_{ch}=25^\circ C$		1.0	1.5	V
Reverse Recovery Time	$t_{rr}$	$I_F=50A$ $V_{GS}=0V$		65		ns
Reverse Recovery Charge	$Q_{rr}$	$-di/dt=100A/\mu s$ $T_{ch}=25^\circ C$		0.12		$\mu C$

### 7.Thermal Resistance

Description	Symbol	min.	typ.	max.	Unit
Channel to Case	$R_{th(ch-c)}$			1.0	$^\circ C/W$
Channel to Ambient	$R_{th(ch-a)}$			35.0	$^\circ C/W$

This material and the information herein is the property of Fuji Electric Co.,Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party nor used for the manufacturing purposes without the express written consent of Fuji Electric Co.,Ltd.

Fig.1 Test circuit

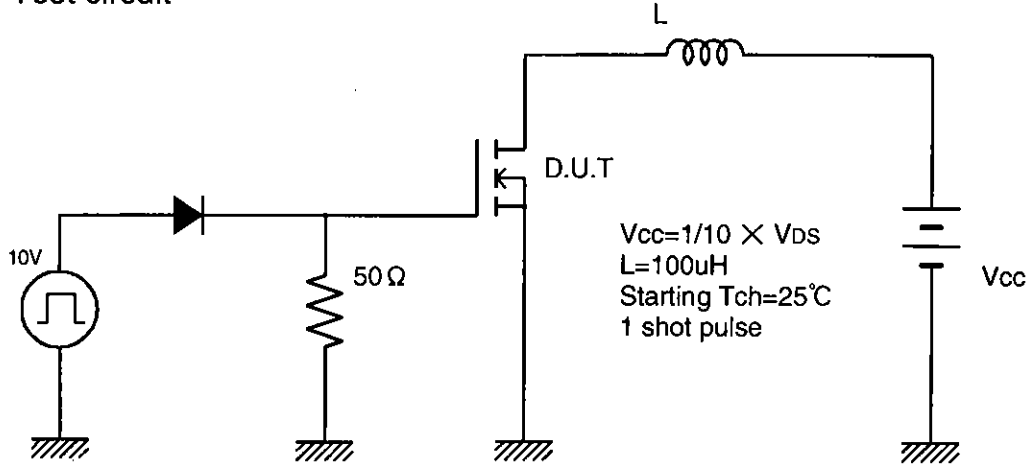
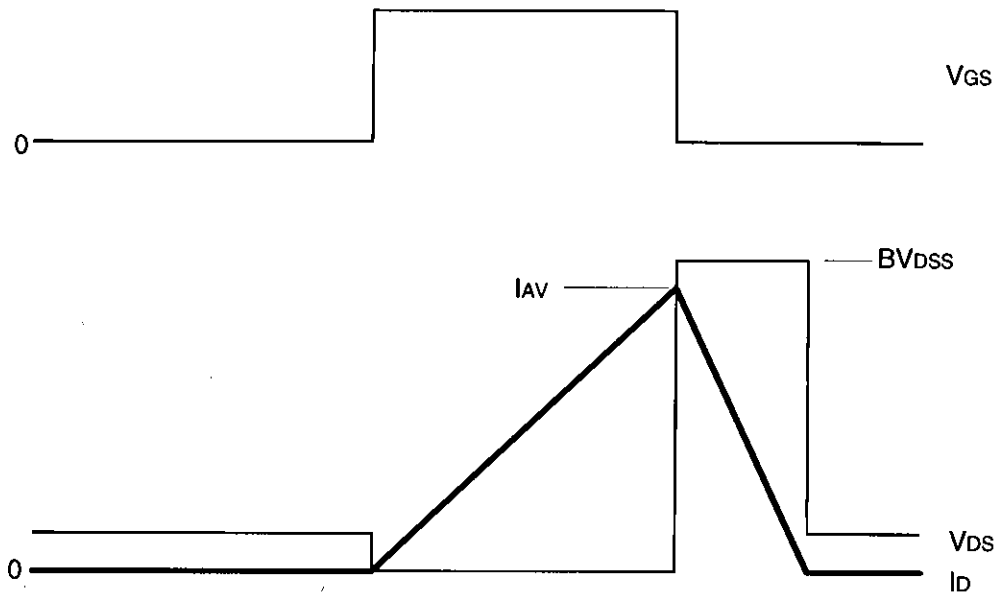
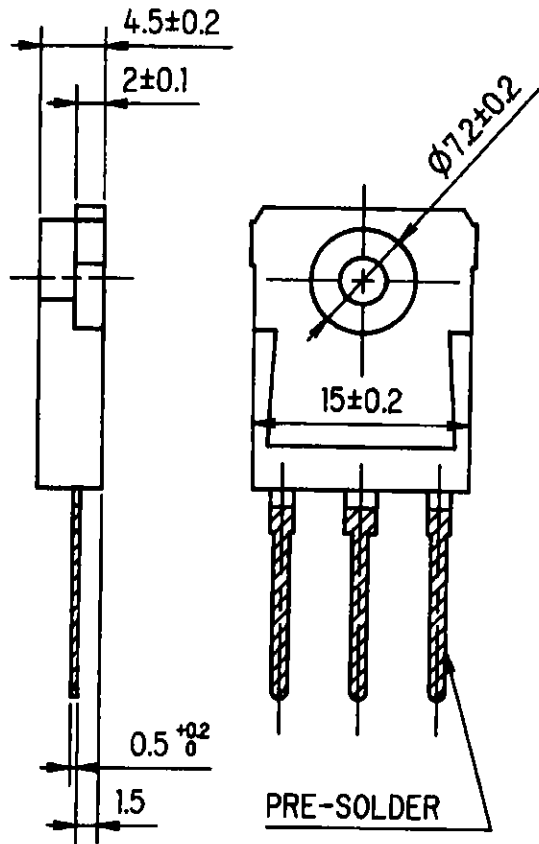
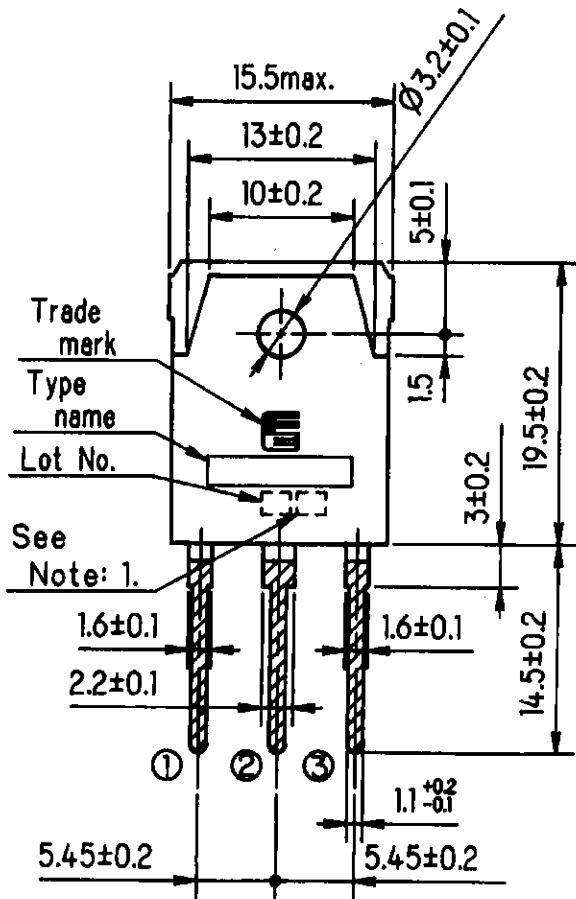


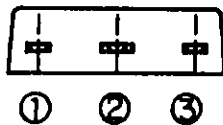
Fig.2 Operating waveforms



This material and the information herein is the property of Fuji Electric Co., Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party nor used for the manufacturing purposes without the express written consent of Fuji Electric Co., Ltd.



DIMENSIONS ARE IN MILLIMETERS.



CONNECTION

- ① GATE
- ② DRAIN
- ③ SOURCE

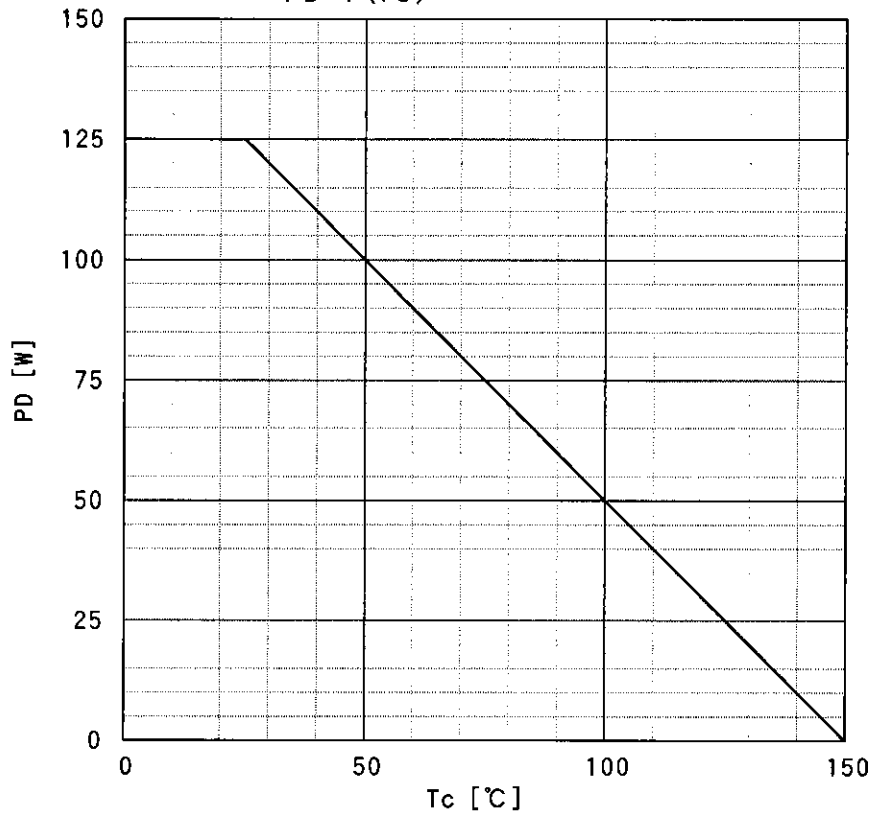
Note: 1. Guaranteed mark of avalanche ruggedness.

JEDEC : TO-247

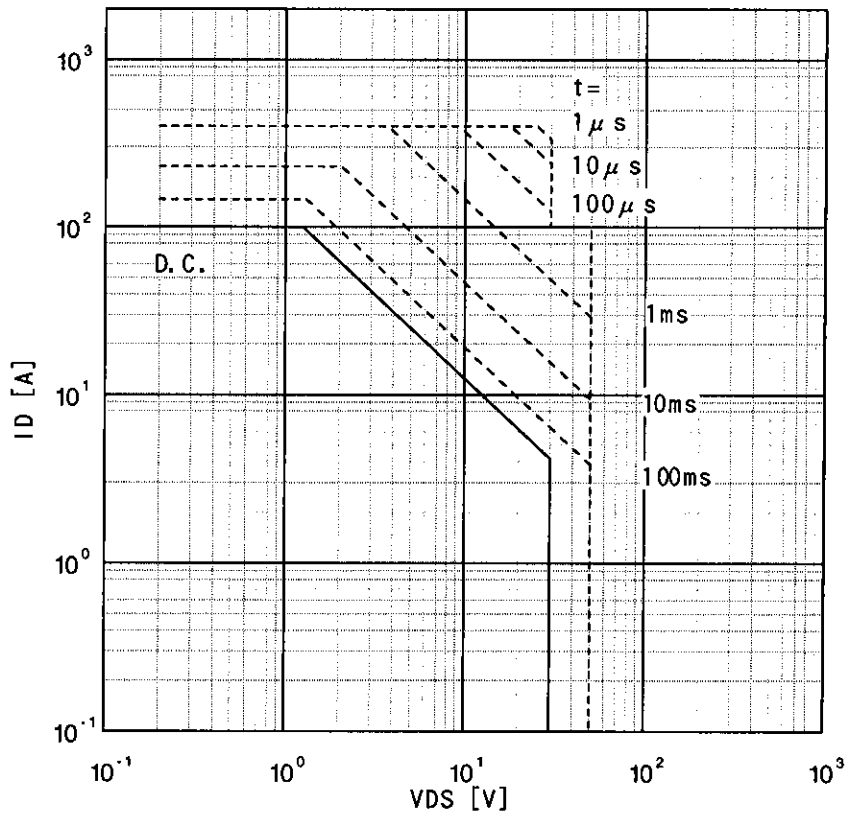
EIAJ : SC-65

This material and the information herein is the property of Fuji Electric Co., Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party nor used for the manufacturing purposes without the express written consent of Fuji Electric Co., Ltd.

Power Dissipation  
 $PD=f(T_c)$

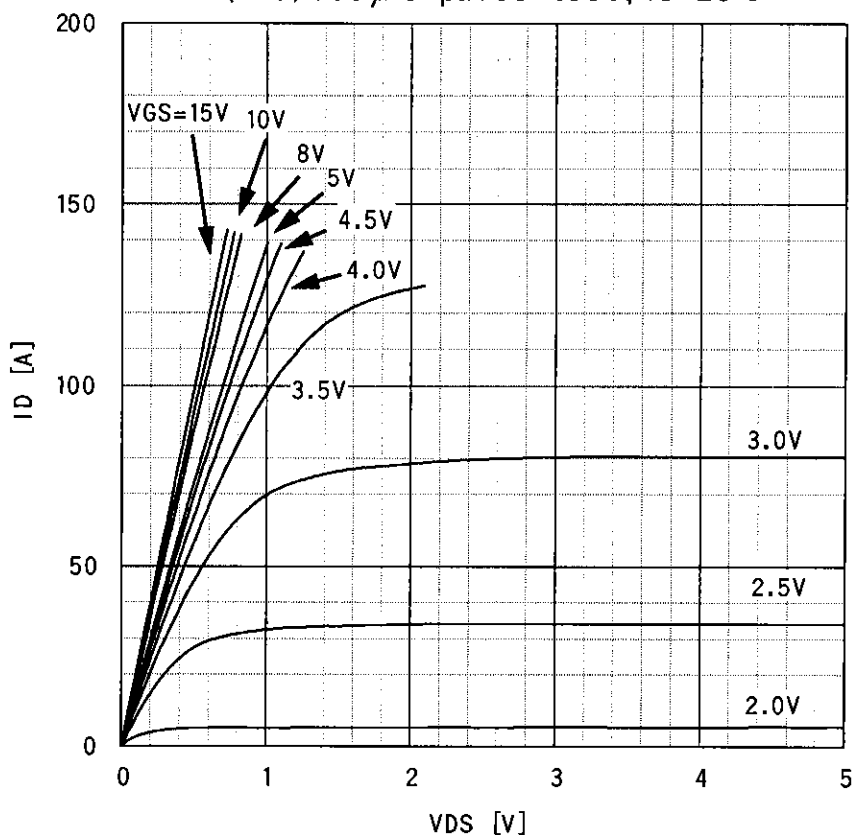


Safe operating area  
 $ID=f(V_{DS}) : D=0.01, T_c=25^\circ\text{C}$

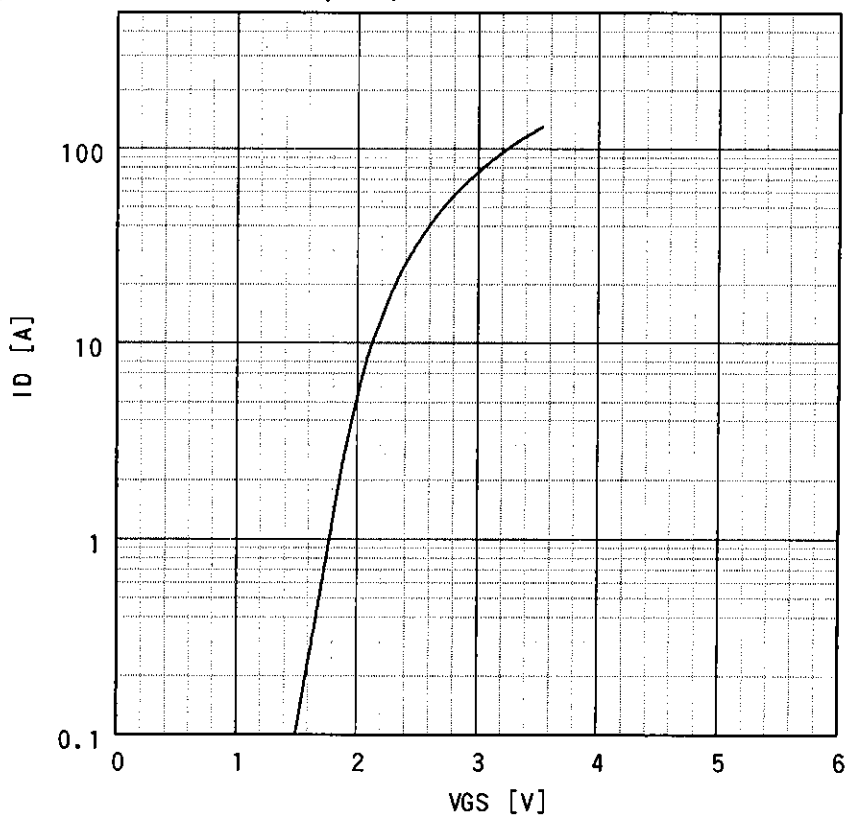


This material and the information herein is the property of Fuji Electric Co., Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party nor used for the manufacturing purposes without the express written consent of Fuji Electric Co., Ltd.

Typical output characteristics  
 $I_D = f(V_{DS}) : 80 \mu s$  pulse test,  $T_c = 25^\circ C$

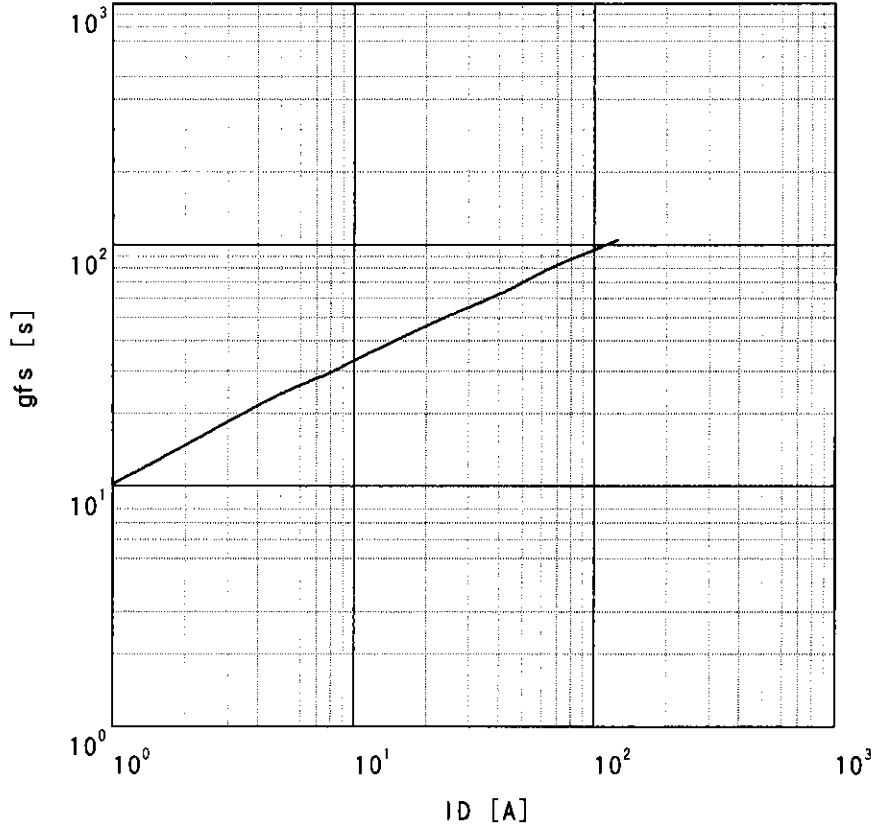


Typical transfer characteristics  
 $I_D = f(V_{GS}) : 80 \mu s$  pulse test,  $V_{DS} = 25V$ ,  $T_{ch} = 25^\circ C$

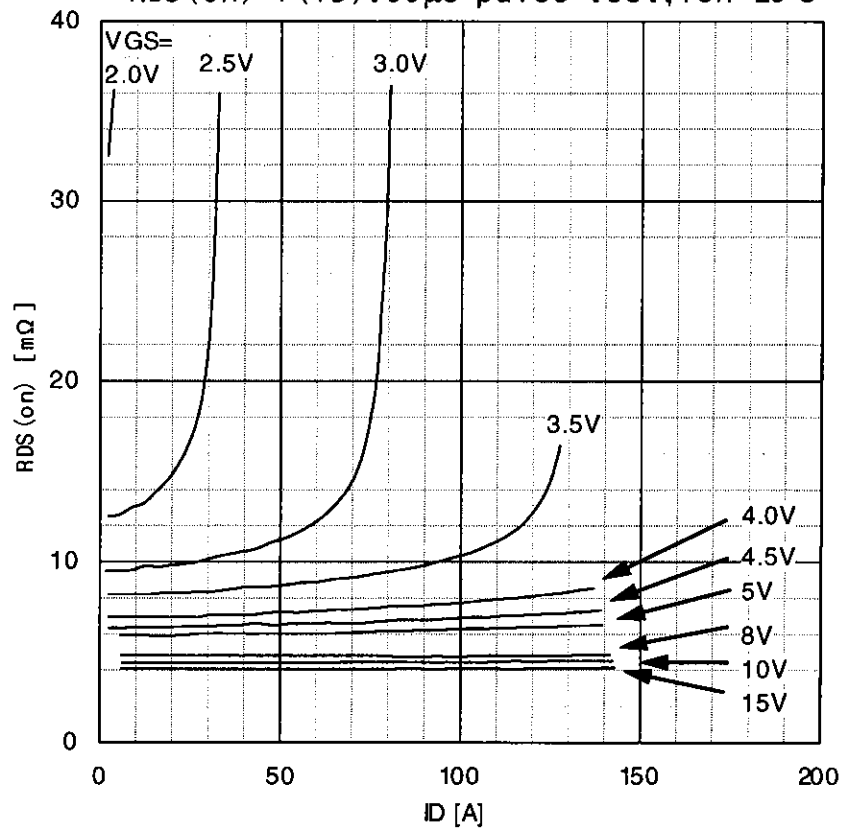


This material and the information herein is the property of Fuji Electric Co., Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party nor used for the manufacturing purposes without the express written consent of Fuji Electric Co., Ltd.

Typical forward transconductance  
 $gfs = f(I_D) : 80 \mu s$  pulse test,  $V_{DS} = 25V$ ,  $T_{ch} = 25^\circ C$



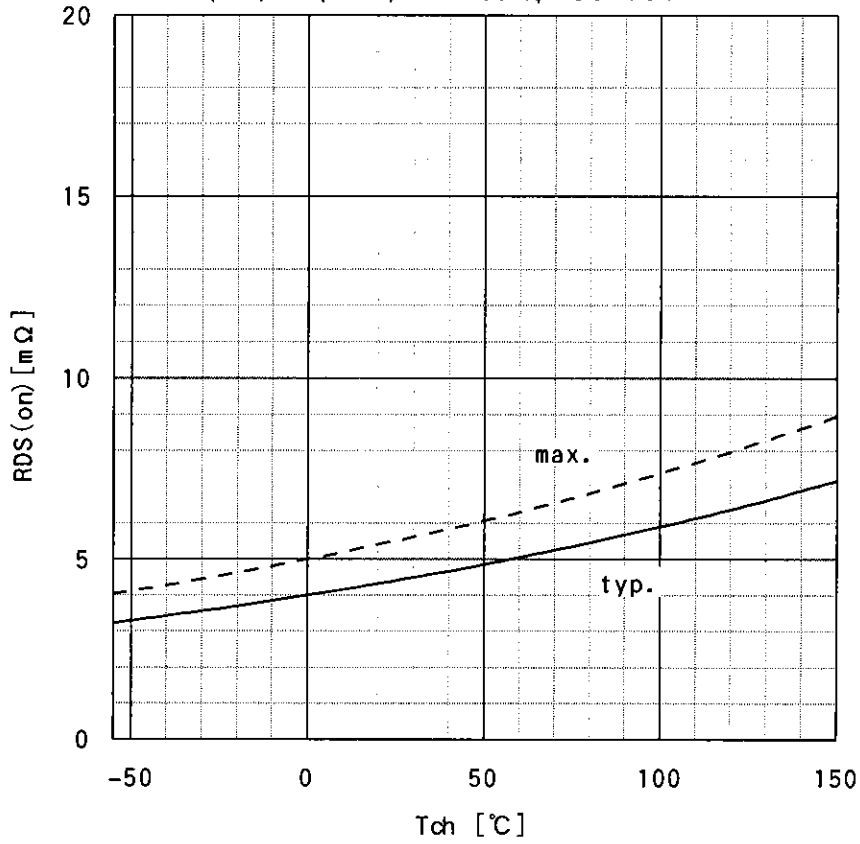
Typical Drain-Source on-State Resistance  
 $R_{DS(on)} = f(I_D) : 80 \mu s$  pulse test,  $T_{ch} = 25^\circ C$



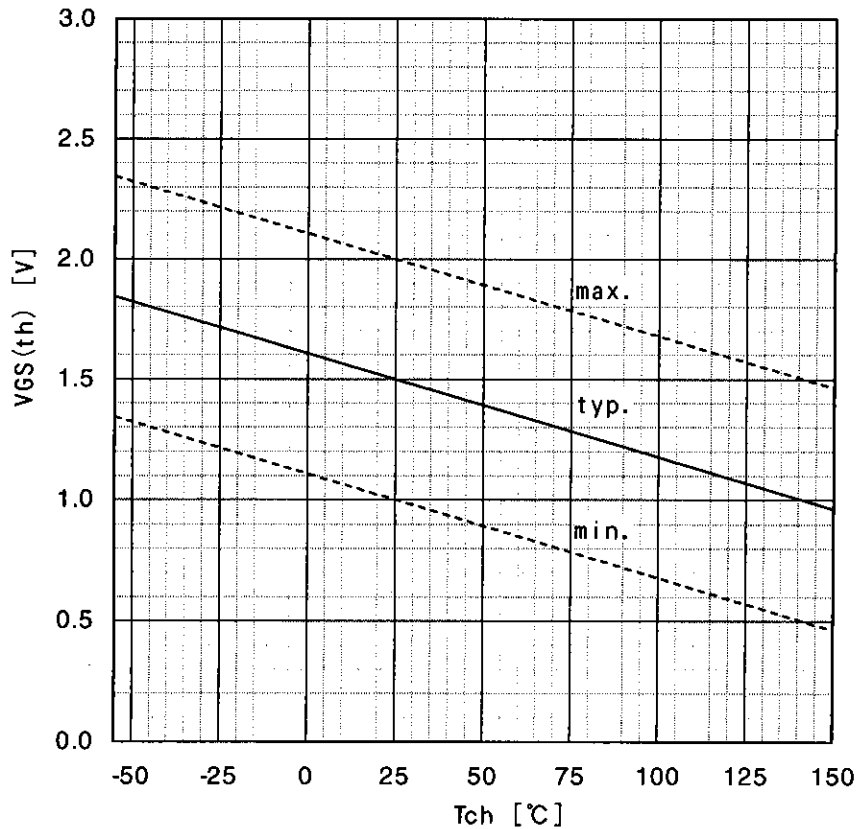


This material and the information herein is the property of Fuji Electric Co., Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party nor used for the manufacturing purposes without the express written consent of Fuji Electric Co., Ltd.

Drain-source on-state resistance  
 $R_{DS(on)} = f(T_{ch}) : I_D = 50A, V_{GS} = 10V$



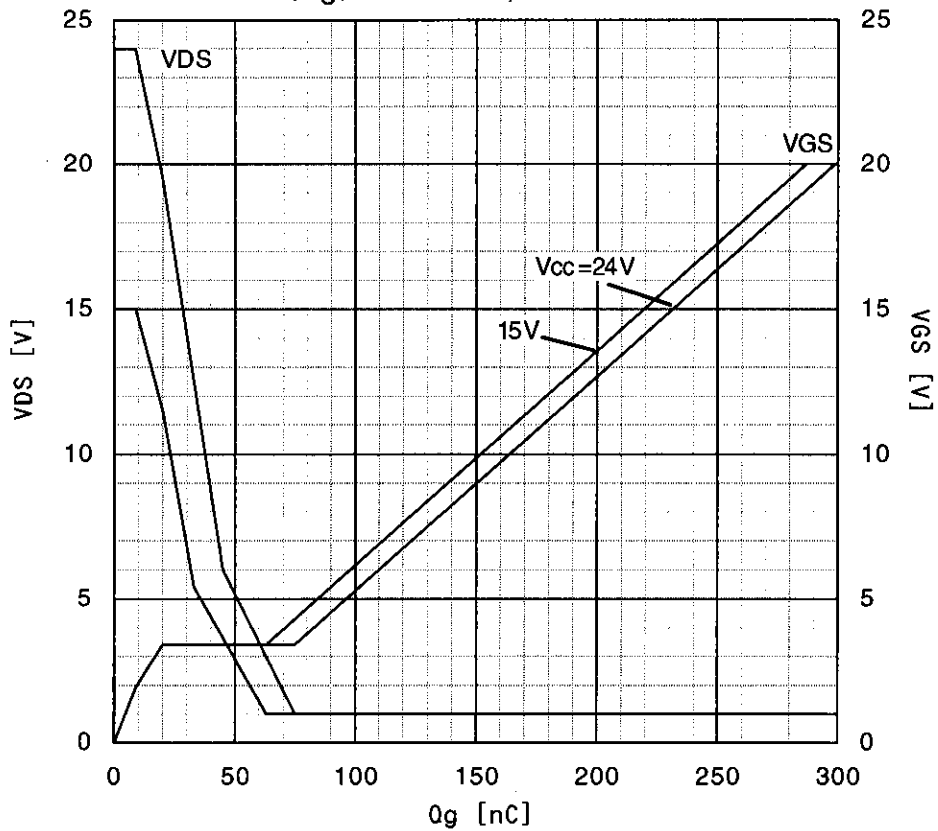
Gate Threshold Voltage vs. Tch  
 $V_{GS(th)} = f(T_{ch}) : V_{DS} = V_{GS}, I_D = 1mA$



This material and the information herein is the property of Fuji Electric Co.,Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party nor used for the manufacturing purposes without the express written consent of Fuji Electric Co.,Ltd.

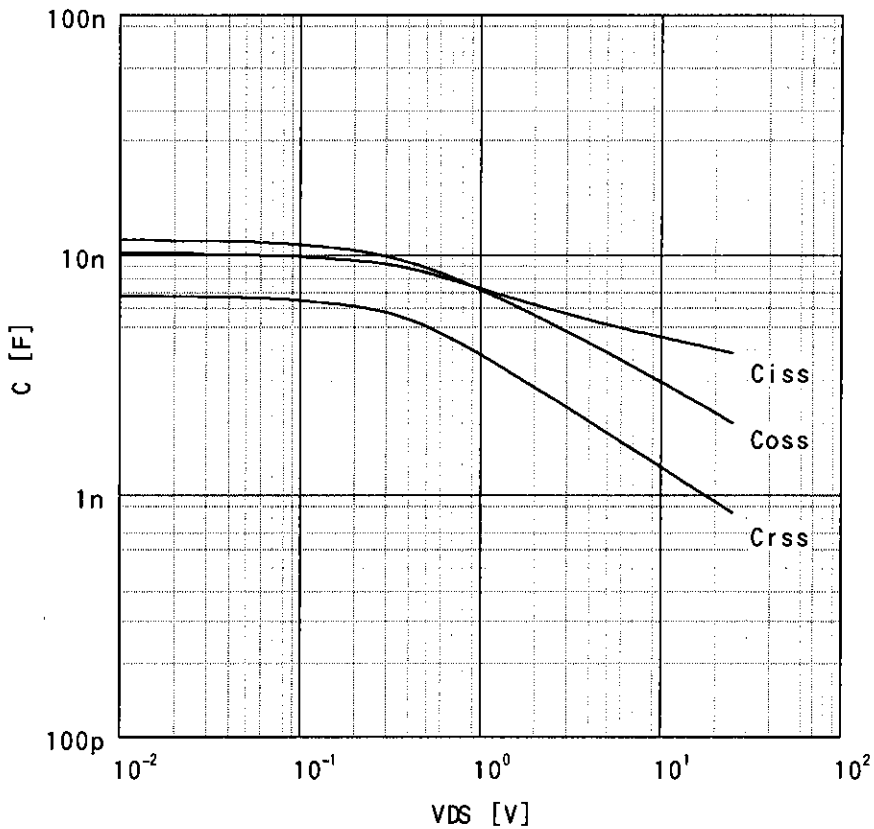
### Typical Gate Charge Characteristics

$V_{GS}=f(Q_g) : I_D=100A, T_{ch}=25^\circ C$



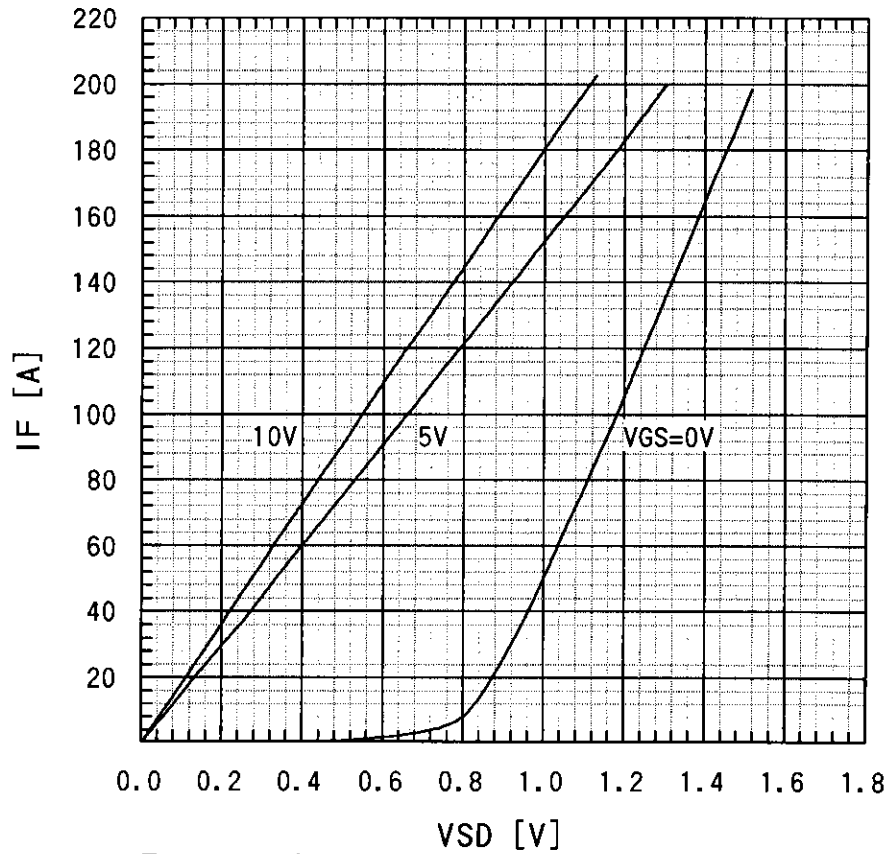
### Typical capacitances

$C=f(V_{DS}) : V_{GS}=0V, f=1MHz$

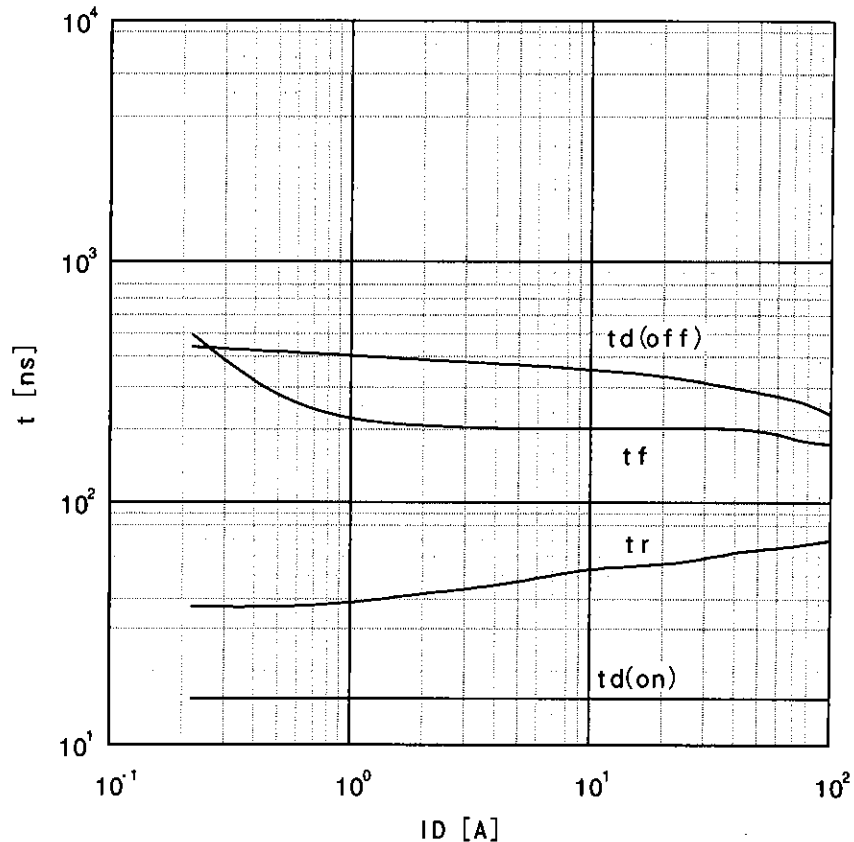


This material and the information herein is the property of Fuji Electric Co., Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party nor used for the manufacturing purposes without the express written consent of Fuji Electric Co., Ltd.

### Typical Forward Characteristics of Reverse Diode $I_F = f(V_{SD}) : 80 \mu s$ pulse test, $T_{ch} = 25^\circ C$

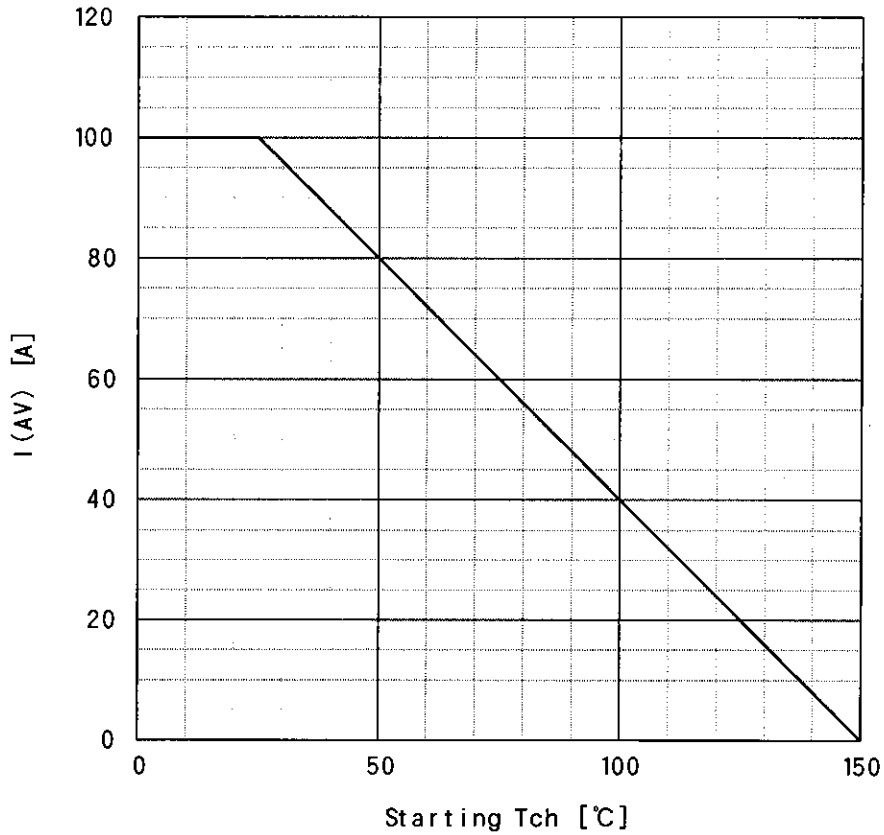


### Typical Switching Characteristics vs. $I_D$ $t = f(I_D) : V_{CC} = 15V, V_{GS} = 10V, R_G = 10 \Omega$

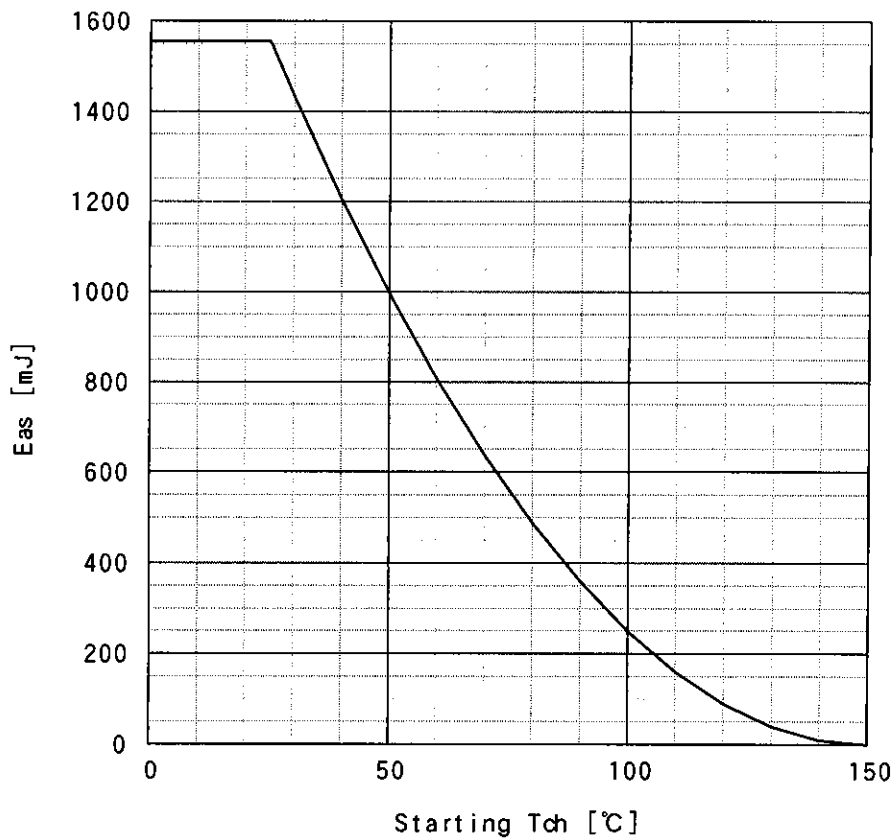


This material and the information herein is the property of Fuji Electric Co., Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party nor used for the manufacturing purposes without the express written consent of Fuji Electric Co., Ltd.

Maximum Avalanche Current vs. starting Tch  
 $I_{AV} = f(\text{starting Tch})$



Maximum Avalanche energy vs. starting Tch  
 $E_{as} = f(\text{starting Tch}) : V_{CC} = 12V, I_{AV} \leq 100A$



This material and the information herein is the property of Fuji Electric Co.,Ltd. They shall be neither reproduced, copied, lent, or disclosed in any way whatsoever for the use of any third party nor used for the manufacturing purposes without the express written consent of Fuji Electric Co.,Ltd.

Transient thermal impedande  
 $Z_{thch}=f(t)$  parameter:  $D=t/T$

