

# SPECIFICATION

(TENTATIVE)

Device Name : Power MOSFET

Type Name : 2SK2891-01

Spec. No. :

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Fuji Electric Co.,Ltd.  
Matsumoto Factory

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

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### Dynamic Ratings

Description	Symbol	Conditions	min.	typ.	max.	Unit
Forward Transconductance	$g_{fs}$	$I_b=50A$ $V_{DS}=25V$	35	70		S
Input Capacitance	$C_{iss}$	$V_{DS}=25V$		3900	5850	pF
Output Capacitance	$C_{oss}$	$V_{GS}=0V$		2000	3000	
Reverse Transfer Capacitance	$C_{rss}$	$f=1MHz$		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	$^\circ C/W$

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Fig.1 Test circuit

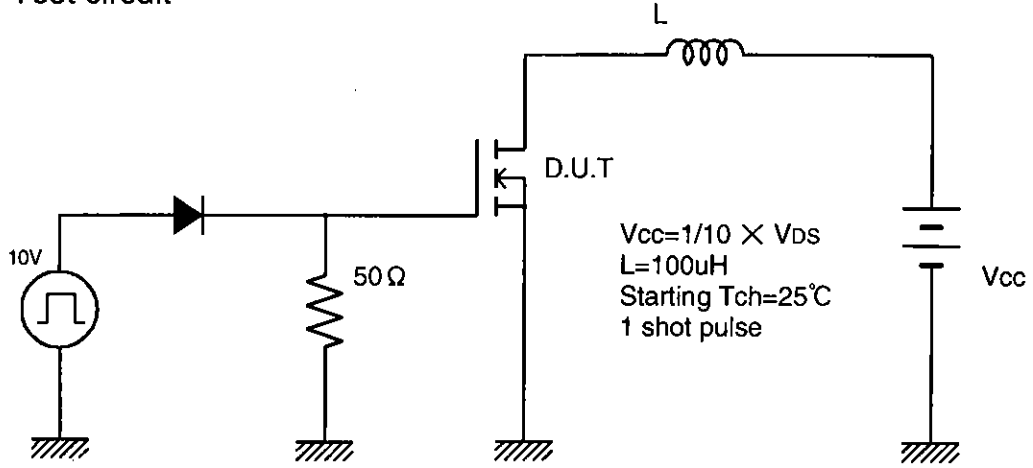
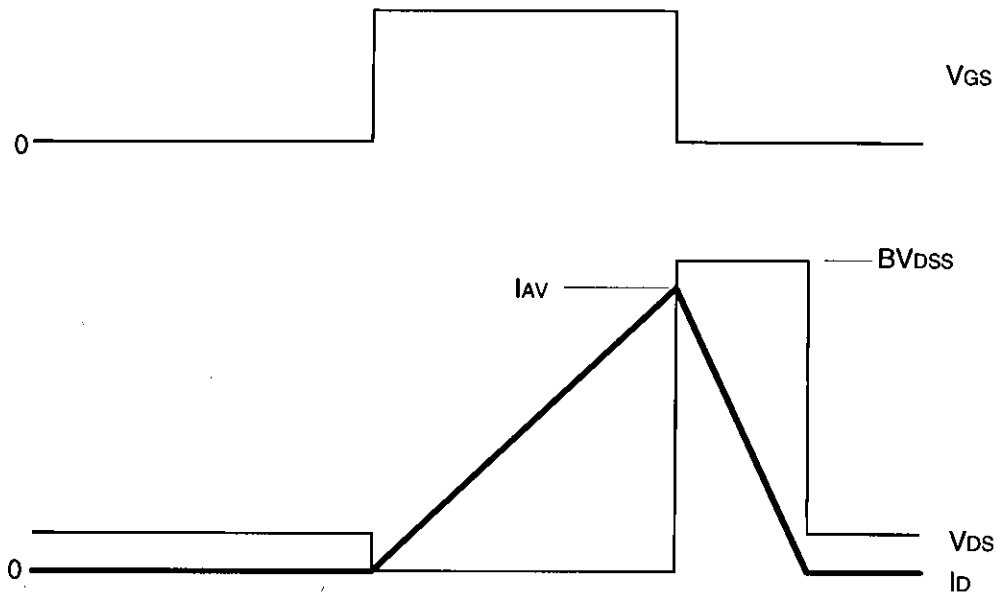


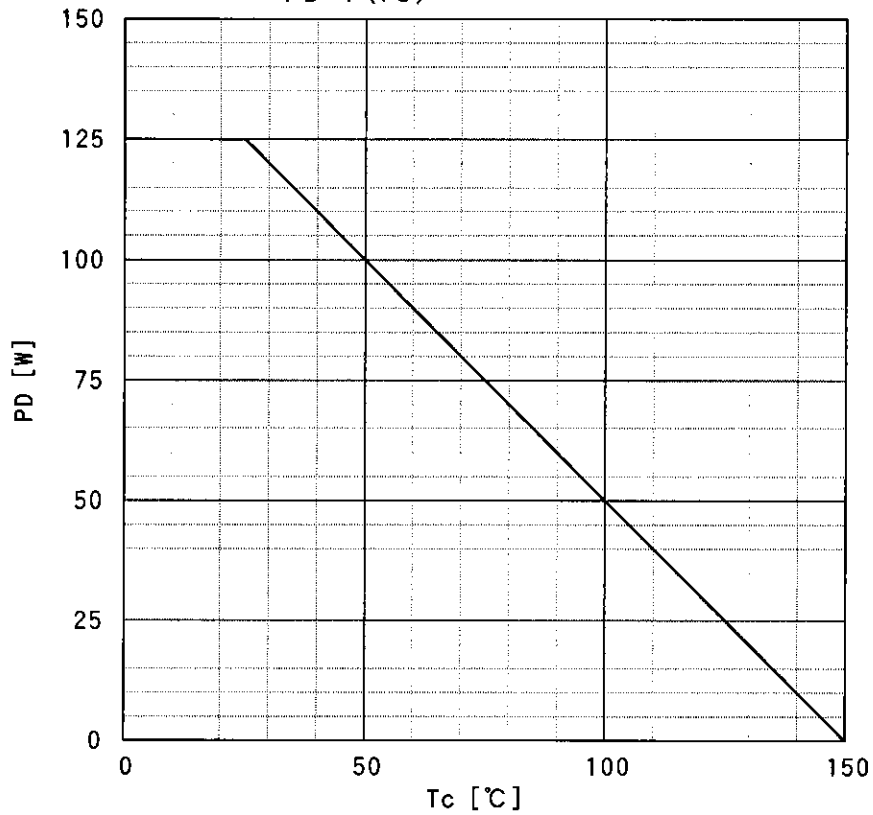
Fig.2 Operating waveforms



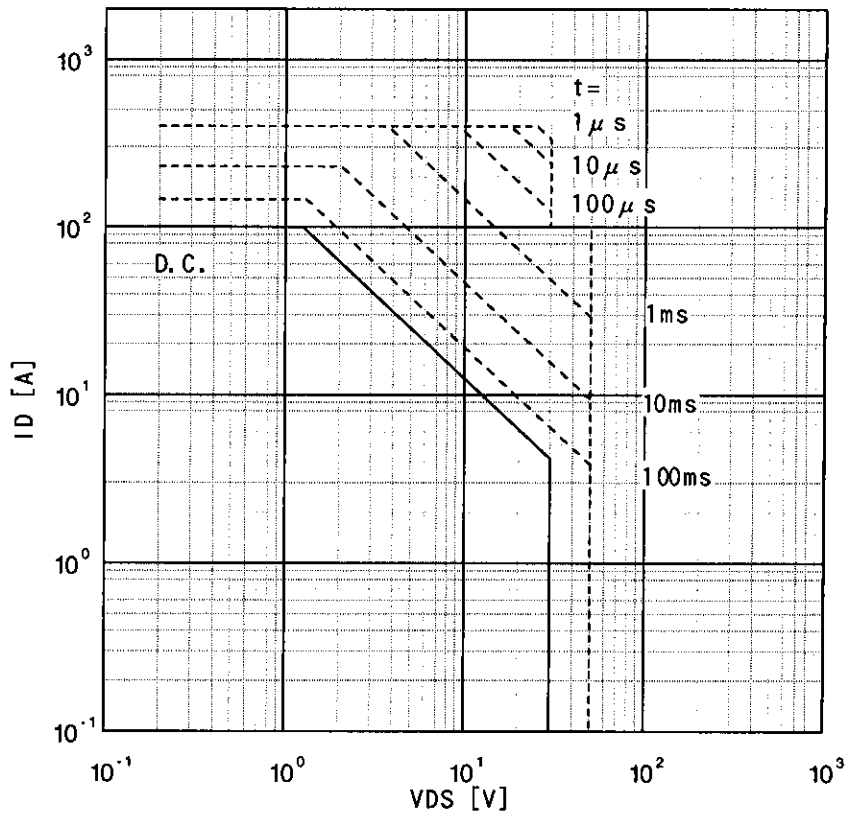


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Power Dissipation  
 $PD=f(T_c)$

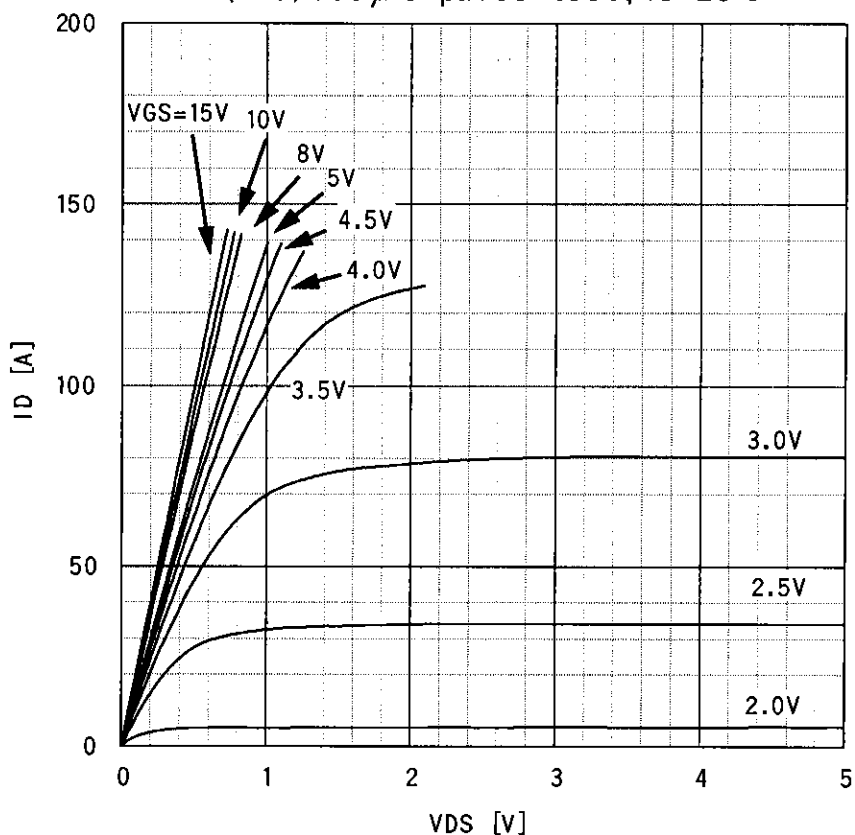


Safe operating area  
 $ID=f(V_{DS}) : D=0.01, T_c=25^\circ\text{C}$

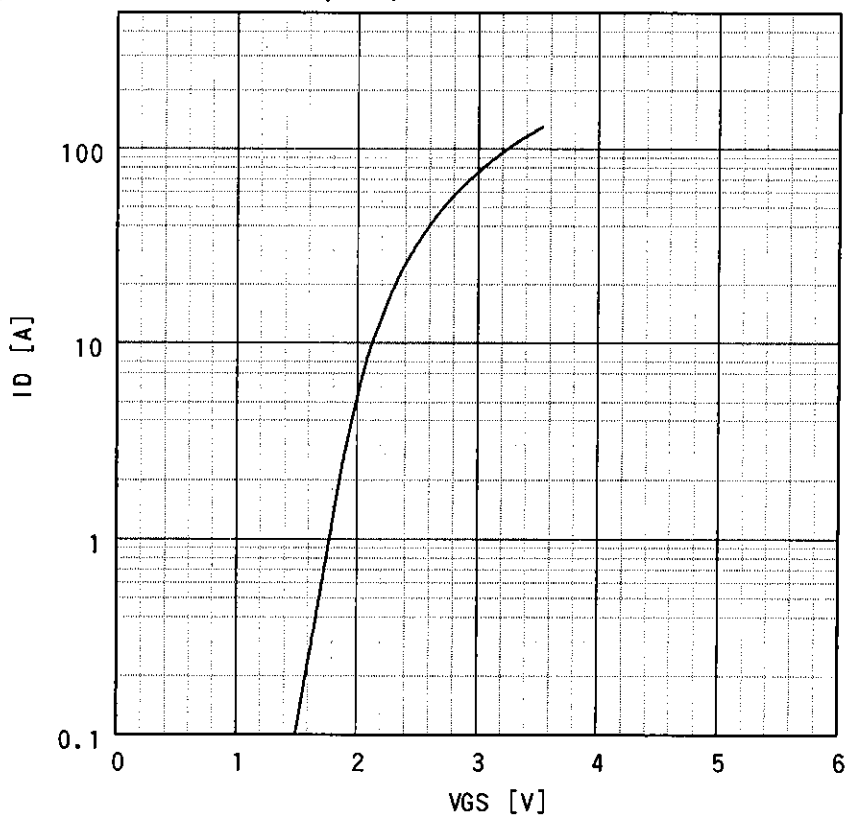


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Typical output characteristics  
 $I_D = f(V_{DS}) : 80 \mu s$  pulse test,  $T_c = 25^\circ C$

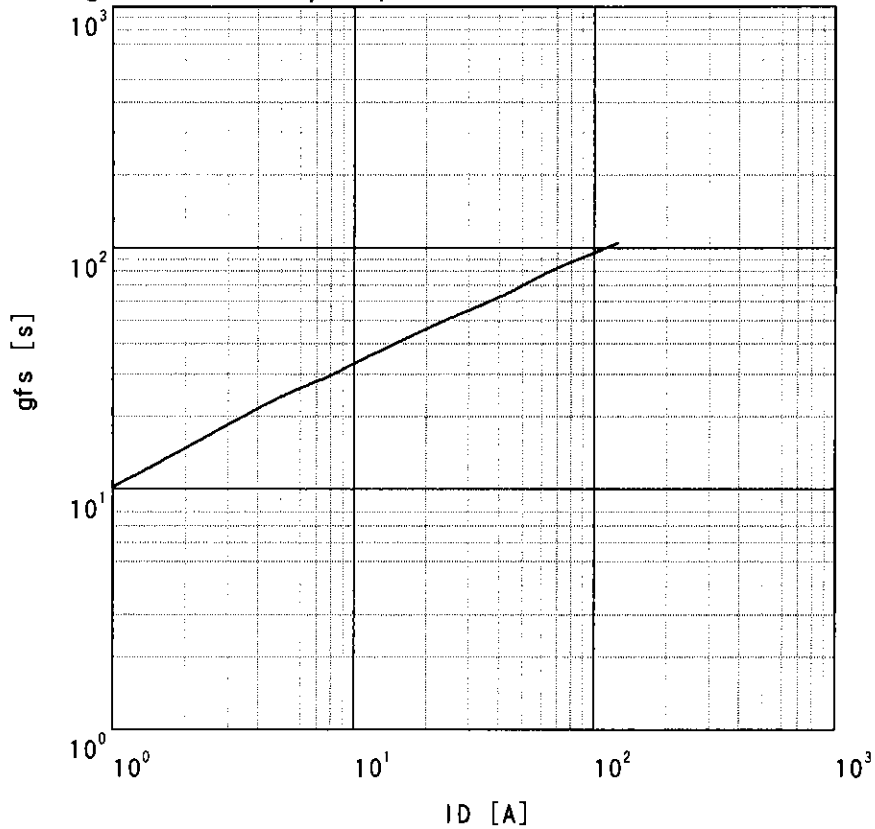


Typical transfer characteristics  
 $I_D = f(V_{GS}) : 80 \mu s$  pulse test,  $V_{DS} = 25V$ ,  $T_{ch} = 25^\circ C$

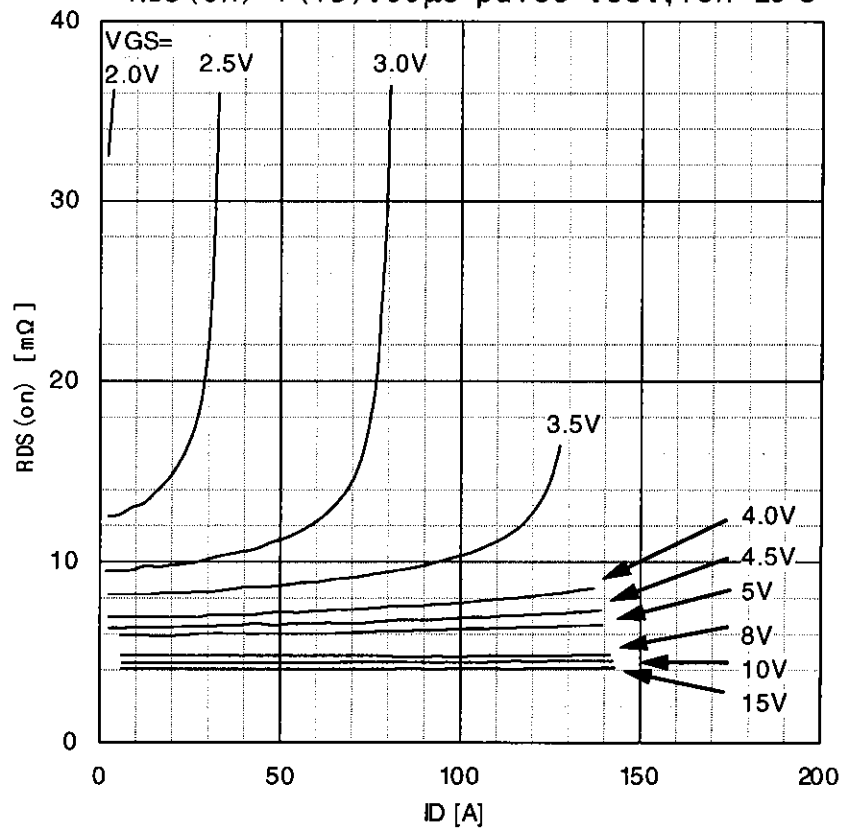


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Typical forward transconductance  
 $gfs = f(I_D) : 80 \mu s$  pulse test,  $V_{DS} = 25V$ ,  $T_{ch} = 25^\circ C$



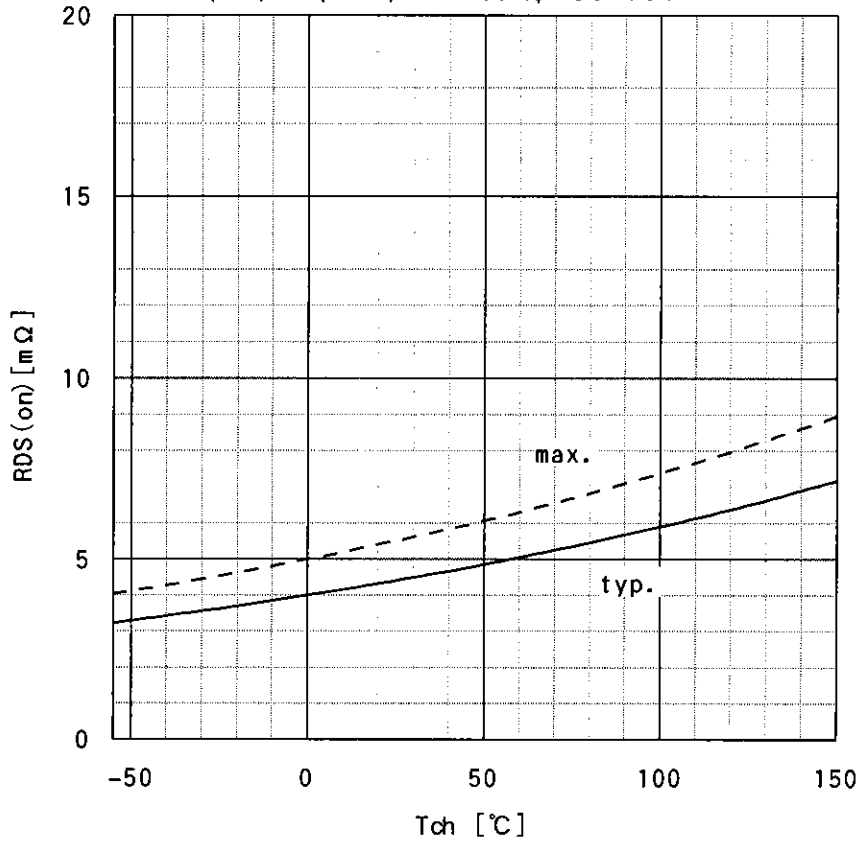
Typical Drain-Source on-State Resistance  
 $R_{DS(on)} = f(I_D) : 80 \mu s$  pulse test,  $T_{ch} = 25^\circ C$



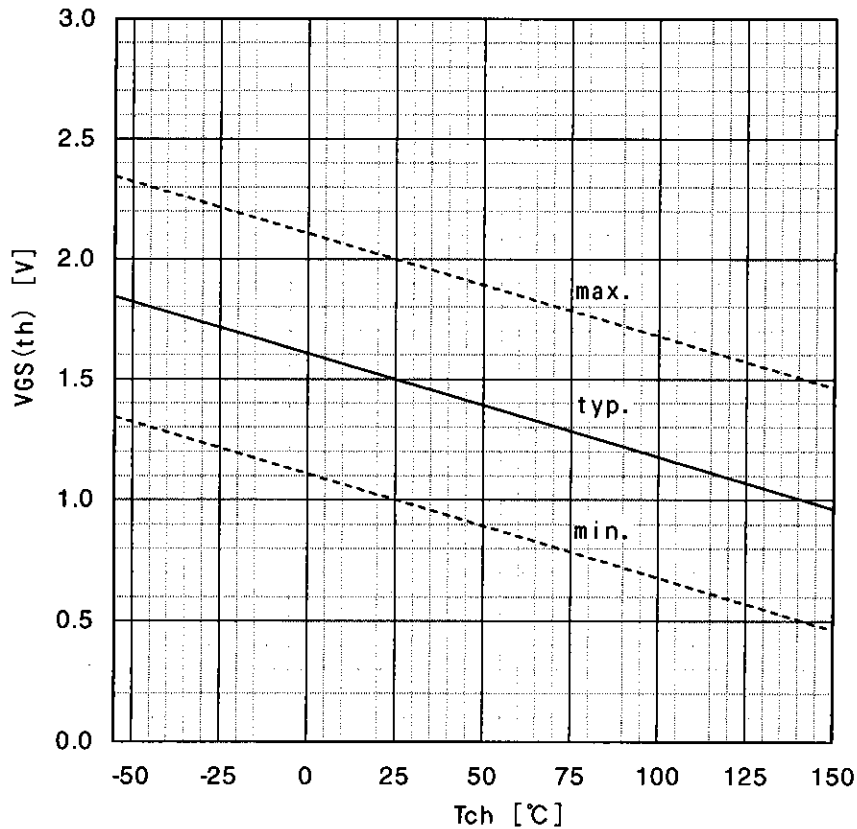


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Drain-source on-state resistance  
 $R_{DS(on)} = f(T_{ch}) : I_D = 50A, V_{GS} = 10V$



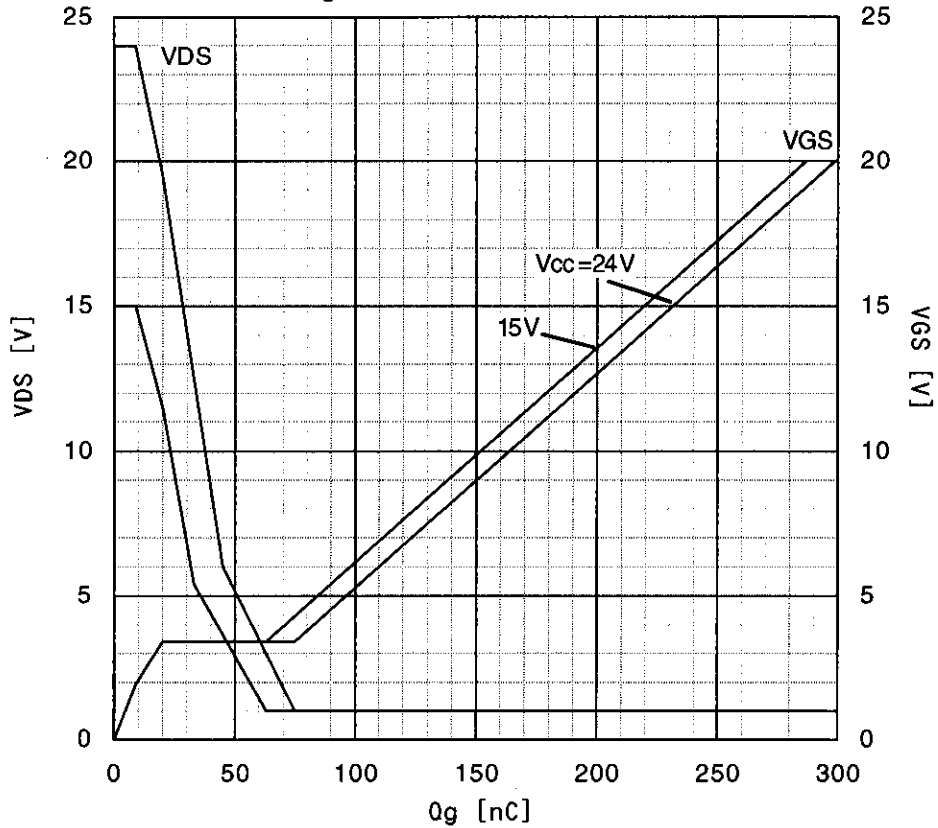
Gate Threshold Voltage vs. Tch  
 $V_{GS(th)} = f(T_{ch}) : V_{DS} = V_{GS}, I_D = 1mA$



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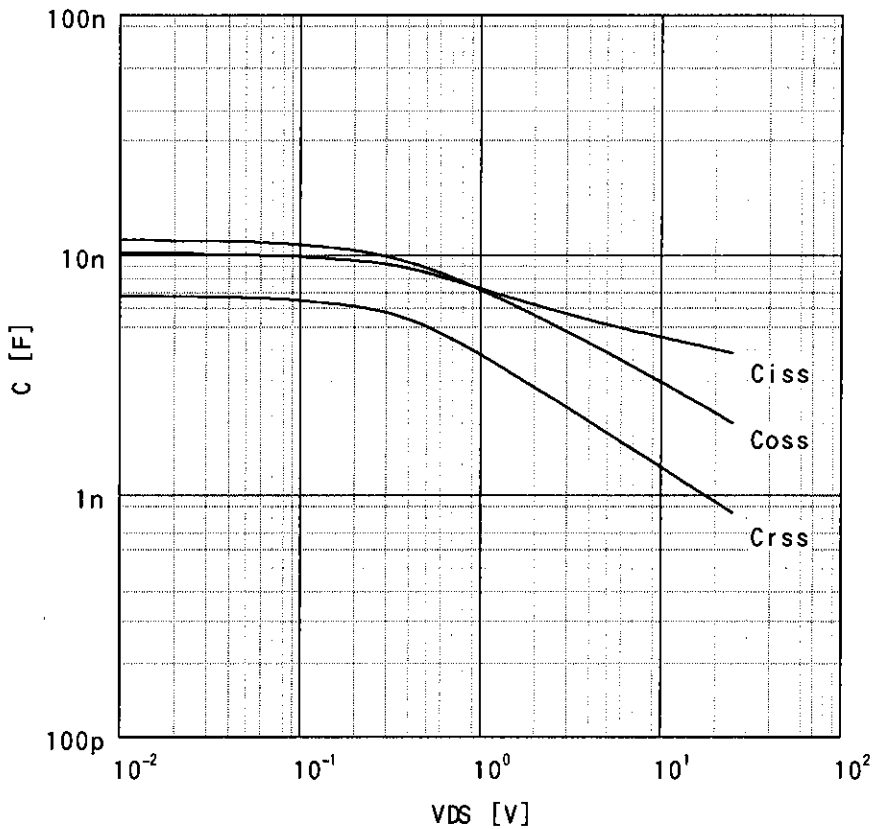
### Typical Gate Charge Characteristics

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



### Typical capacitances

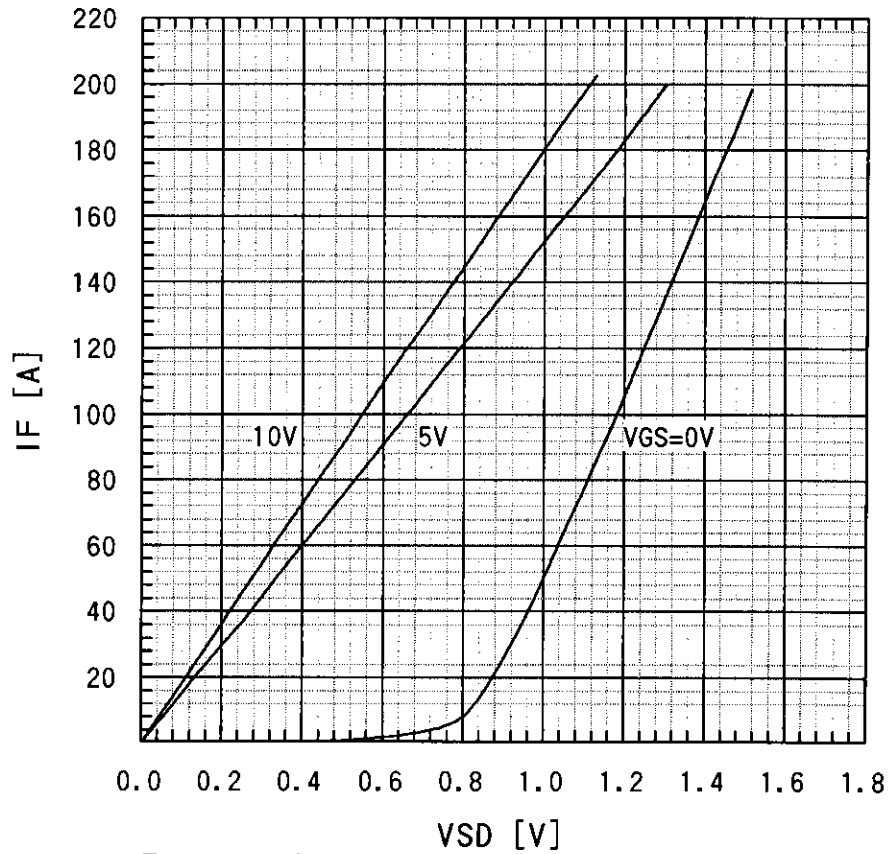
$C=f(V_{DS}) : V_{GS}=0V, f=1MHz$



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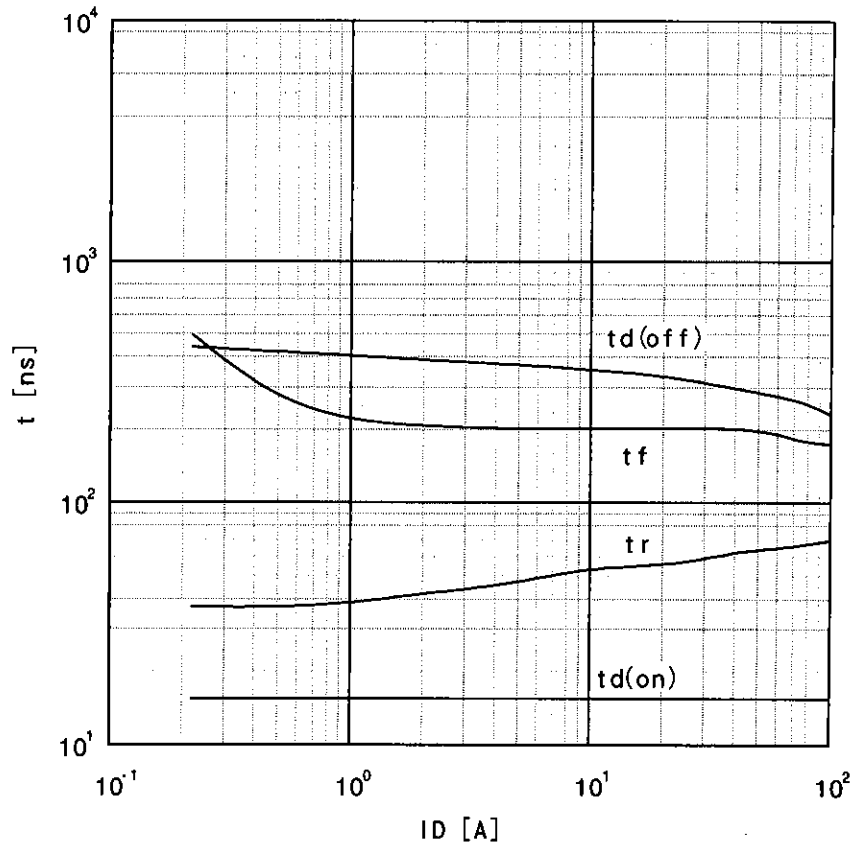
### Typical Forward Characteristics of Reverse Diode

$I_F = f(V_{SD}) : 80 \mu s \text{ pulse test, } T_{ch} = 25^\circ C$



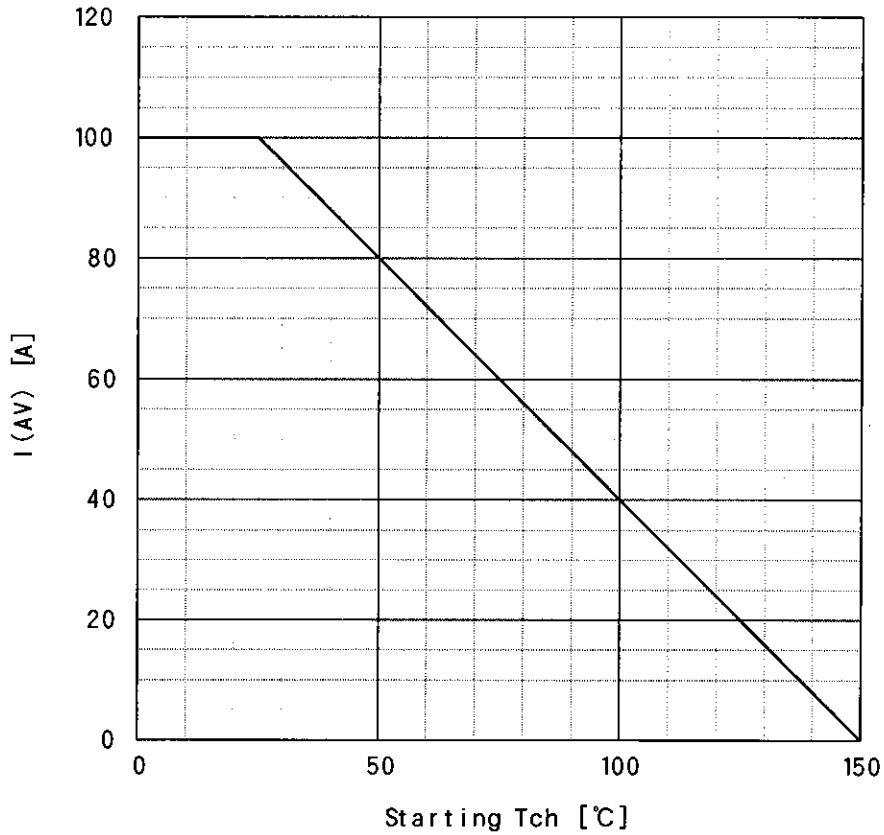
### Typical Switching Characteristics vs. $I_D$

$t = f(I_D) : V_{CC} = 15V, V_{GS} = 10V, R_G = 10 \Omega$

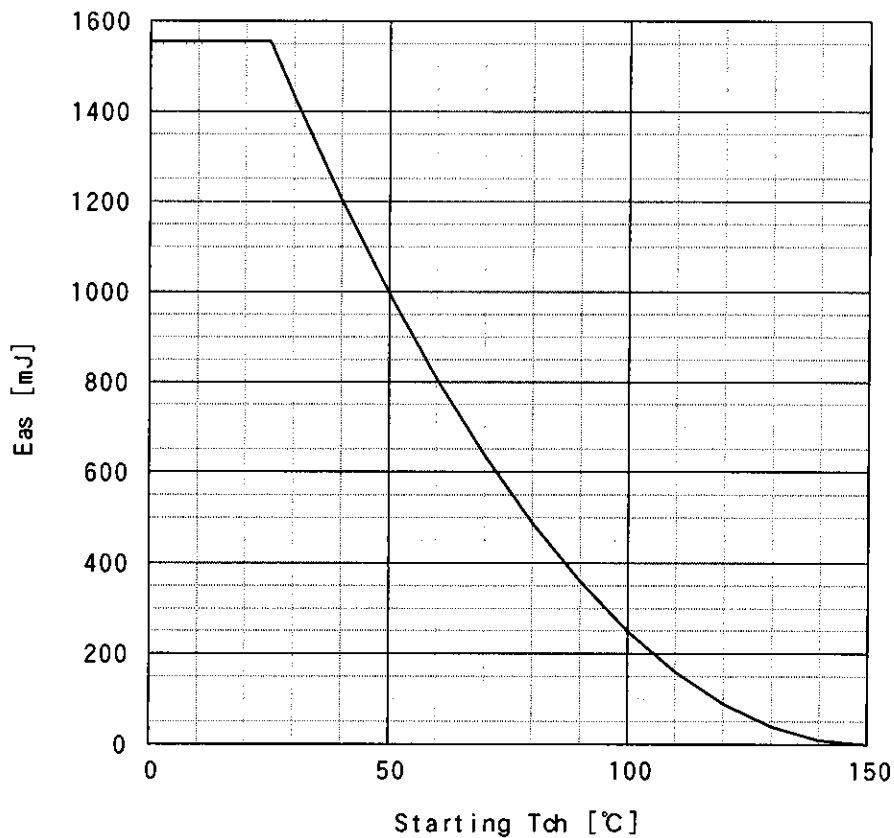


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Maximum Avalanche Current vs. starting Tch  
 $I_{AV} = f(\text{starting Tch})$



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



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

