

SPECIFICATION

Device Name POWER MOSFET

Type Name 2SK2844-01

Spec. No. MS5 F 3062

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Matsumoto Factory

DATE	NAME	APPROVED	Fuji Electric Co., Ltd.	
DRAWN	May 2 - 1979		MS5 F 3062	1/2
CHECKED	May 7 - 1979			

104-004-07

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- 1.Scope This specifies Fuji Power MOSFET 2SK2644-01
- 2.Construction N-Channel enhancement mode power MOSFET
- 3.Applications for Switching
- 4.Outview TO-3P Outview See to 5/12 page

5.Absolute Maximum Ratings at $T_c=25^{\circ}\text{C}$ (unless otherwise specified)

Description	Symbol	Characteristics	Unit	Remarks
Drain-Source Voltage	V_{DS}	500	V	
Continuous Drain Current	I_D	± 18	A	
Pulsed Drain Current	I_{DP}	± 72	A	
Gate-Source Voltage	V_{GS}	± 35	V	
Repetitive or non-repetitive	I_{AV}	18	A	$T_{ch} \leq 150^{\circ}\text{C}$
Maximum Avalanche Energy	E_{AV}	518.5	mJ	*1
Maximum Power Dissipation	P_D	125	W	
Operating and Storage	T_{ch}	150	$^{\circ}\text{C}$	
Temperature range	T_{sq}	-55 to +150	$^{\circ}\text{C}$	

*1 $L=2.93\text{mH}$, $V_{CC}=50\text{V}$

6.Electrical Characteristics at $T_c=25^{\circ}\text{C}$ (unless otherwise specified)

Static Ratings

Description	Symbol	Conditions	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=1\text{mA}$ $V_{GS}=0\text{V}$	500	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$I_D=1\text{mA}$ $V_{DS}=V_{GS}$	3.5	4.0	4.5	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=500\text{V}$ $V_{GS}=0\text{V}$	-	10	500	μA
		$T_{ch}=125^{\circ}\text{C}$	-	0.2	1.0	mA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 35\text{V}$ $V_{DS}=0\text{V}$	-	10	100	nA
Drain-Source On-State Resistance	$R_{DS(on)}$	$I_D=9\text{A}$ $V_{GS}=10\text{V}$	-	0.38	0.45	Ω

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TO-3P

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Dynamic Ratings

Description	Symbol	Conditions	min.	typ.	max.	Unit
Forward Transconductance	g_{fs}	$I_D=9A$ $V_{DS}=25V$	5.5	11	-	S
Input Capacitance	C_{iss}	$V_{DS}=25V$ $V_{GS}=0V$ $f=1MHz$	-	1700	2600	pF
Output Capacitance	C_{oss}		-	280	420	
Reverse Transfer Capacitance	C_{rss}		-	120	180	
Turn-On Time	$t_{d(on)}$	$V_{GS}=10V$	-	20	30	ns
	t_r	$I_D=18A$	-	100	150	
Turn-Off Time	$t_{d(off)}$	$R_{GS}=10\Omega$	-	110	165	
	t_f		-	65	100	

Reverse Diode

Description	Symbol	Conditions	min.	typ.	max.	Unit
Avalanche Capability	I_{AV}	$L=2.93mH$ $T_{ch}=25^\circ C$ See Fig.1 and Fig.2	18	-	-	A
Diode Forward On-Voltage	V_{SD}	$I_F=2 \times I_{DR}$ $V_{GS}=0V$ $T_{ch}=25^\circ C$	-	1.1	1.65	V
Reverse Recovery Time	t_{rr}	$I_F=I_{DR}$	-	620	-	ns
Reverse Recovery Charge	Q_{rr}	$-di/dt=100A/\mu s$ $T_{ch}=25^\circ C$	-	9.0	-	μC

7. Thermal Resistance

Description	Symbol	min.	typ.	max.	Unit
Channel to Case	$R_{th(ch-c)}$			1.00	$^\circ C/W$
Channel to Ambient	$R_{th(ch-a)}$			35.0	$^\circ C/W$

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Fig.1 Test circuit

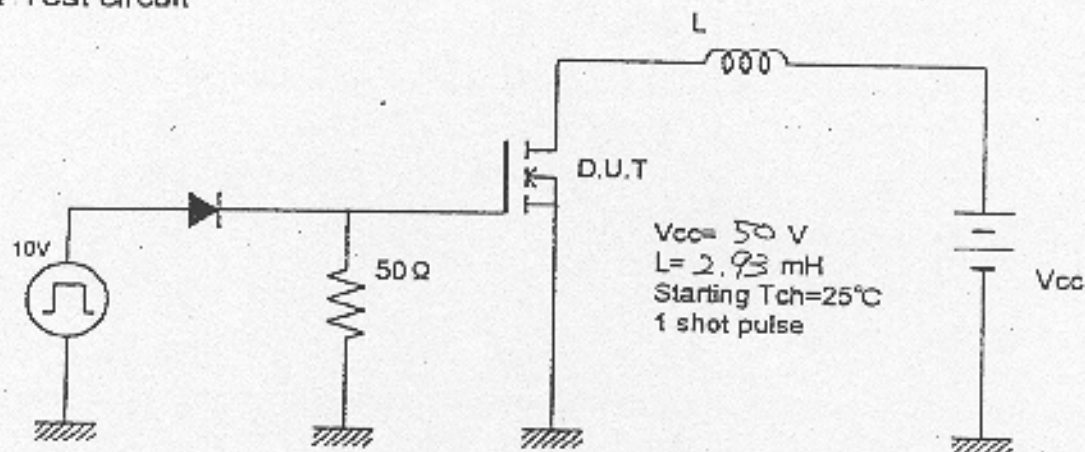
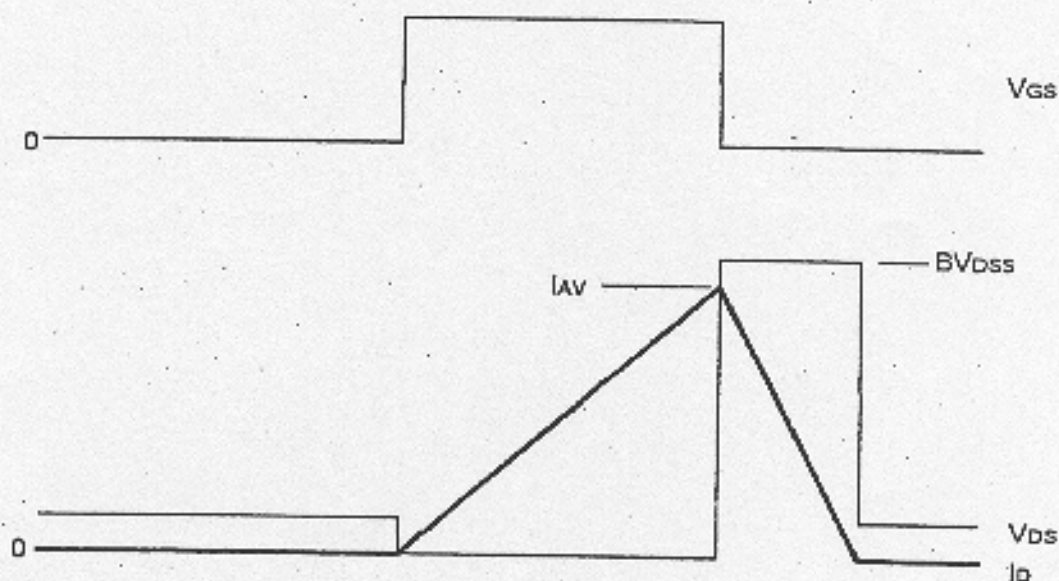


Fig.2 Operating waveforms



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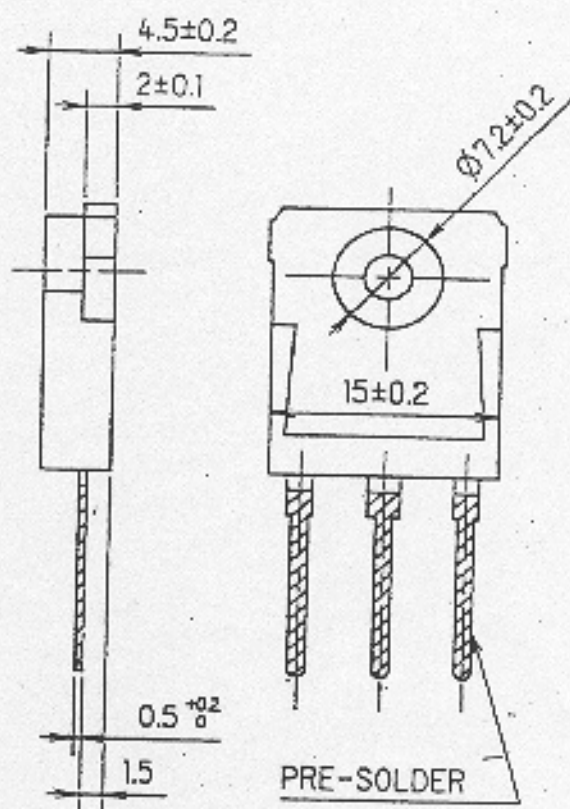
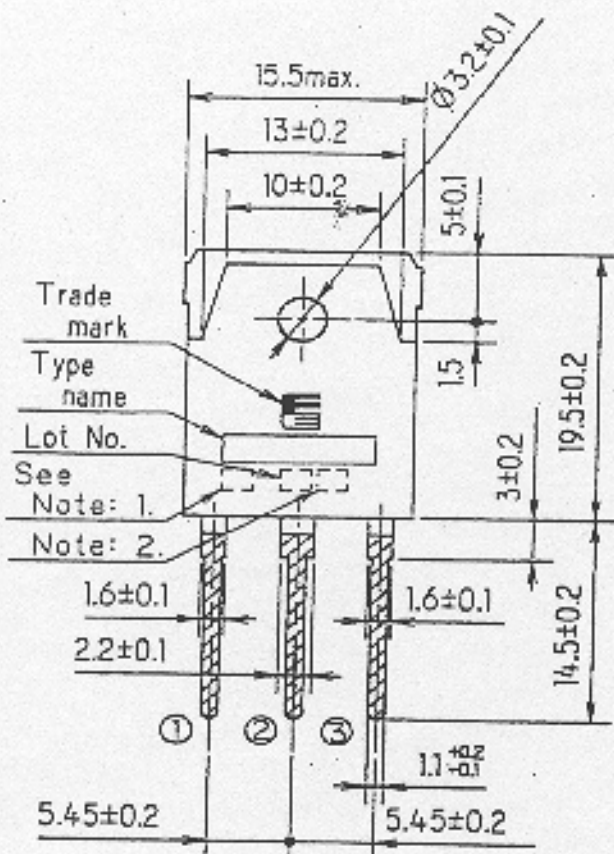
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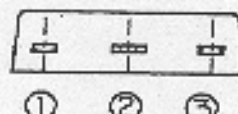
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FUJI POWER MOS FET

TYPE :



DIMENSIONS ARE IN MILLIMETERS.



CONNECTION

- ① GATE
- ② DRAIN
- ③ SOURCE

Note: 1. $V_{GS(TH)}$ selected code.
 Note: 2. Guaranteed mark of avalanche ruggedness.

JEDEC : TO-247
 EIAJ : SC-65

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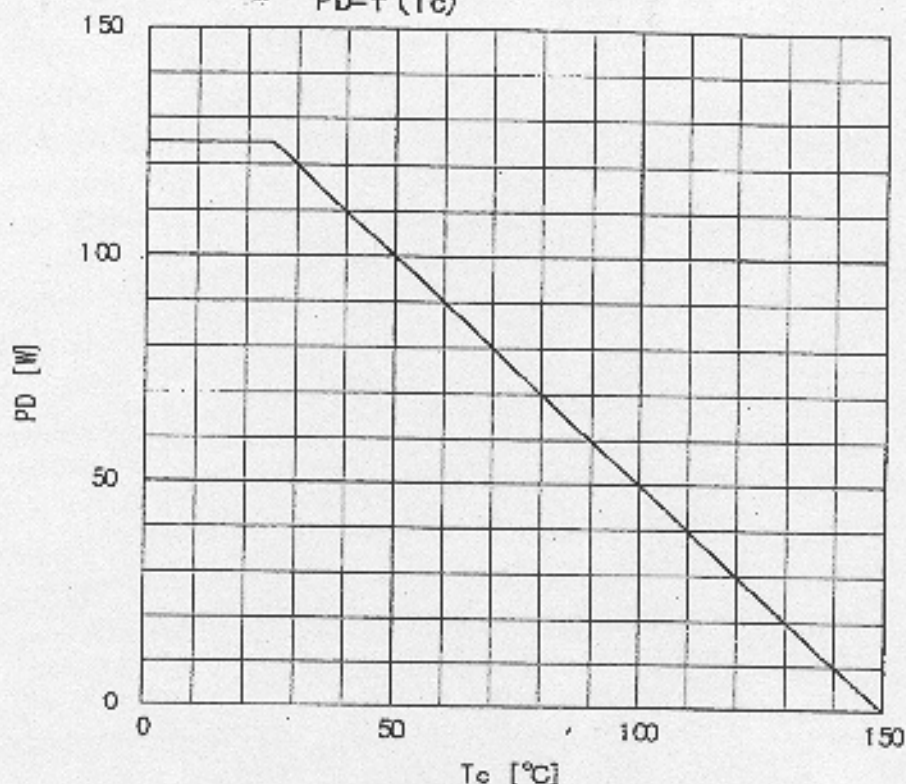
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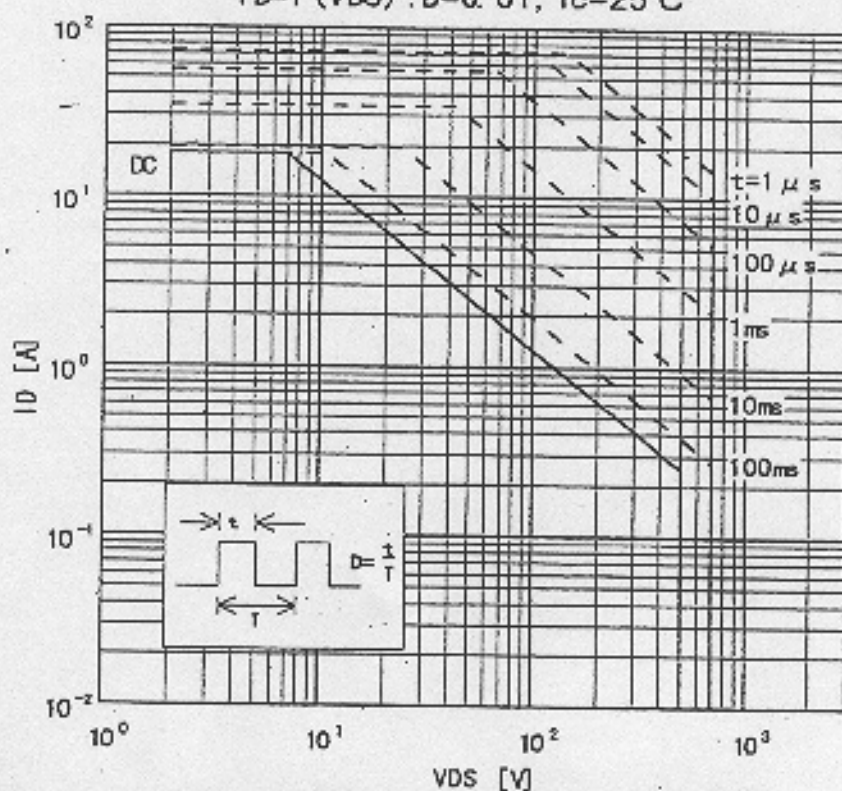
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Power Dissipation
 $PD=f(T_c)$



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



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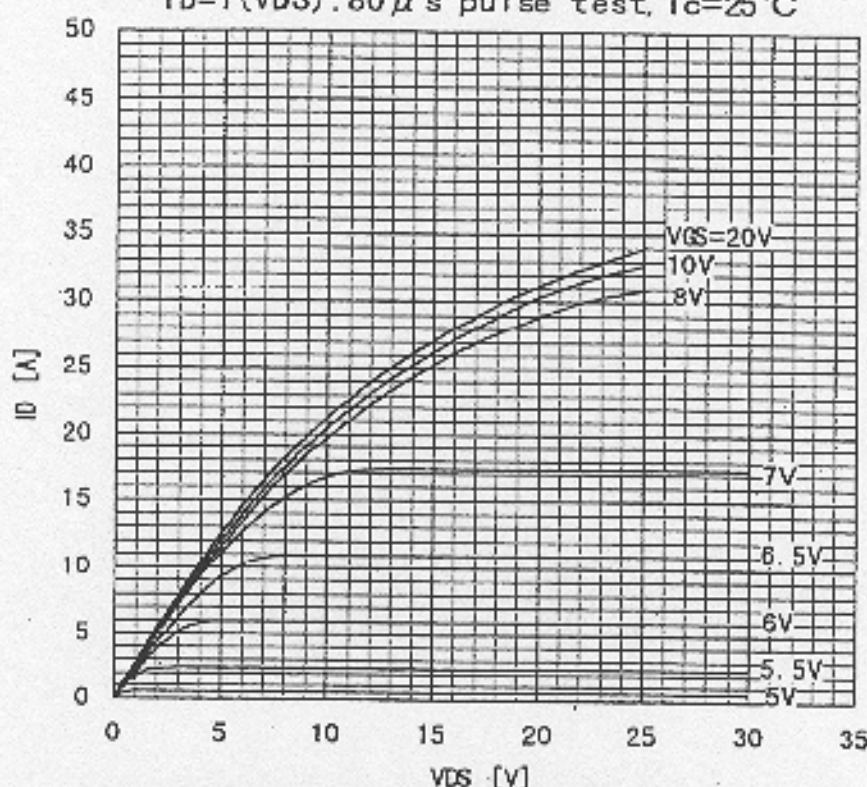
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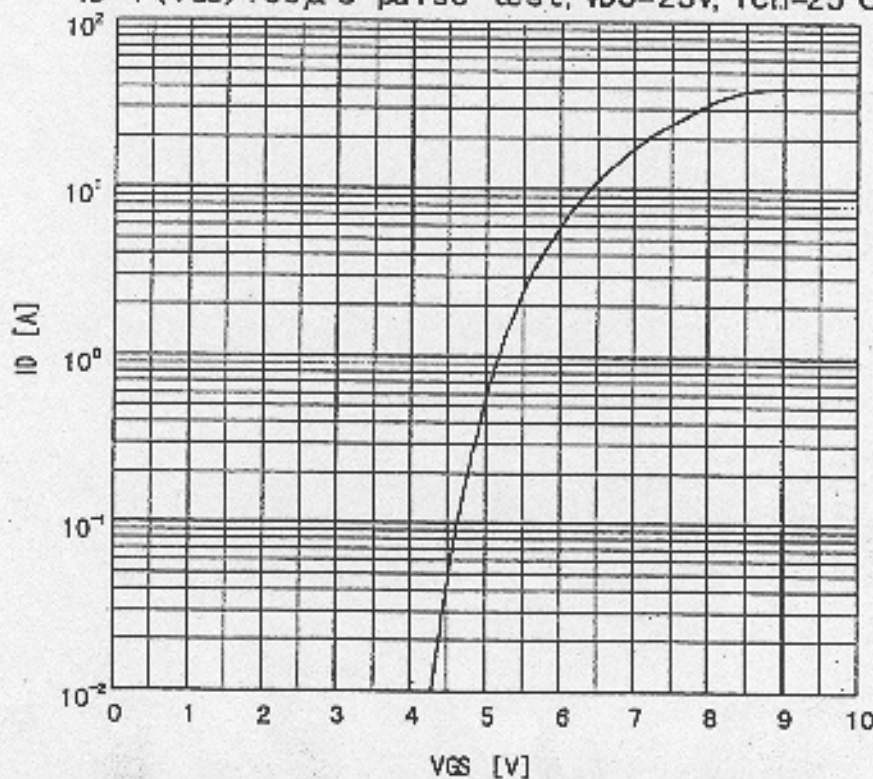
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Typical output characteristics
 $I_D = f(V_{DS}) : 80 \mu s \text{ pulse test, } T_c = 25^\circ C$



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



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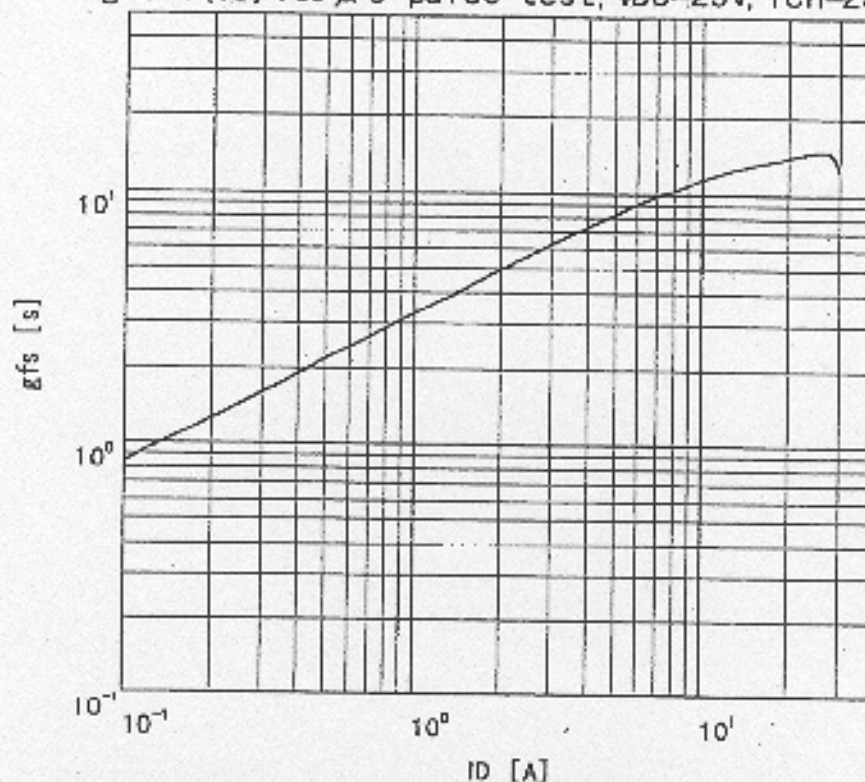
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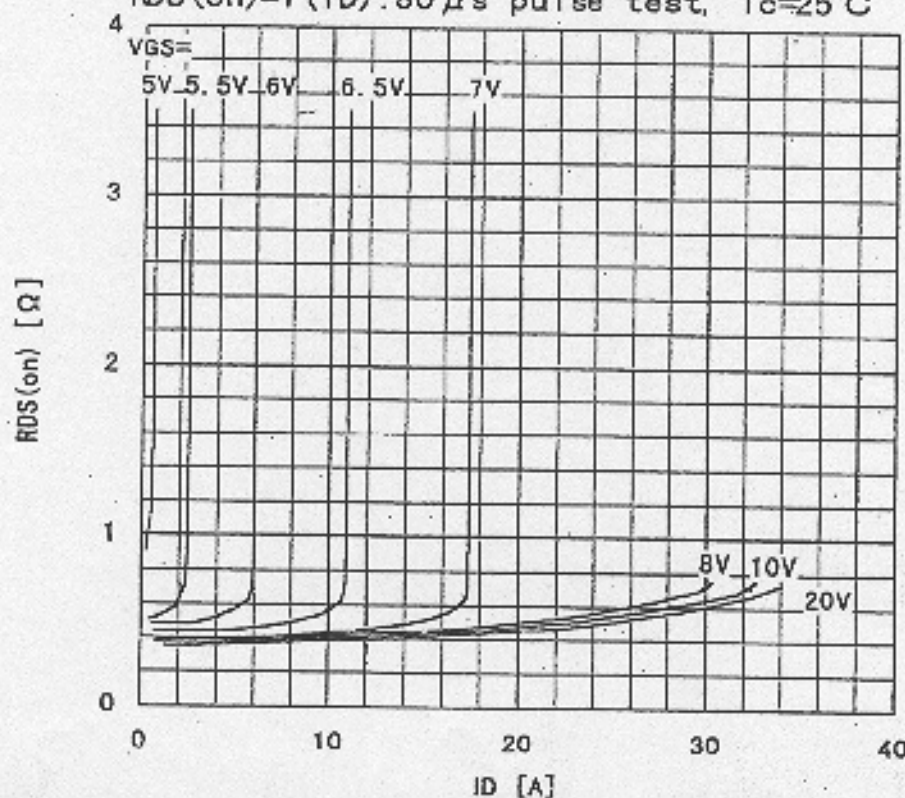
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Typical forward transconductance
 $g_{fs}=f(I_D)$: 80 μ s pulse test, $V_{DS}=25V$, $T_{ch}=25^{\circ}C$



Typical drain-source on-state resistance
 $R_{DS(on)}=f(I_D)$: 80 μ s pulse test, $T_c=25^{\circ}C$



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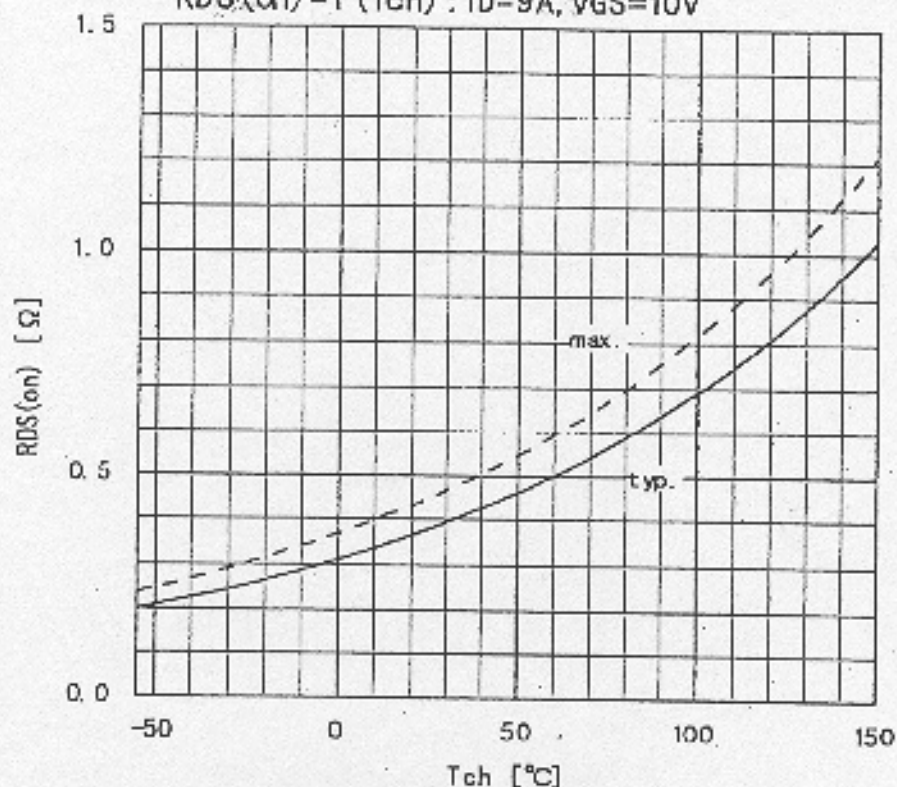
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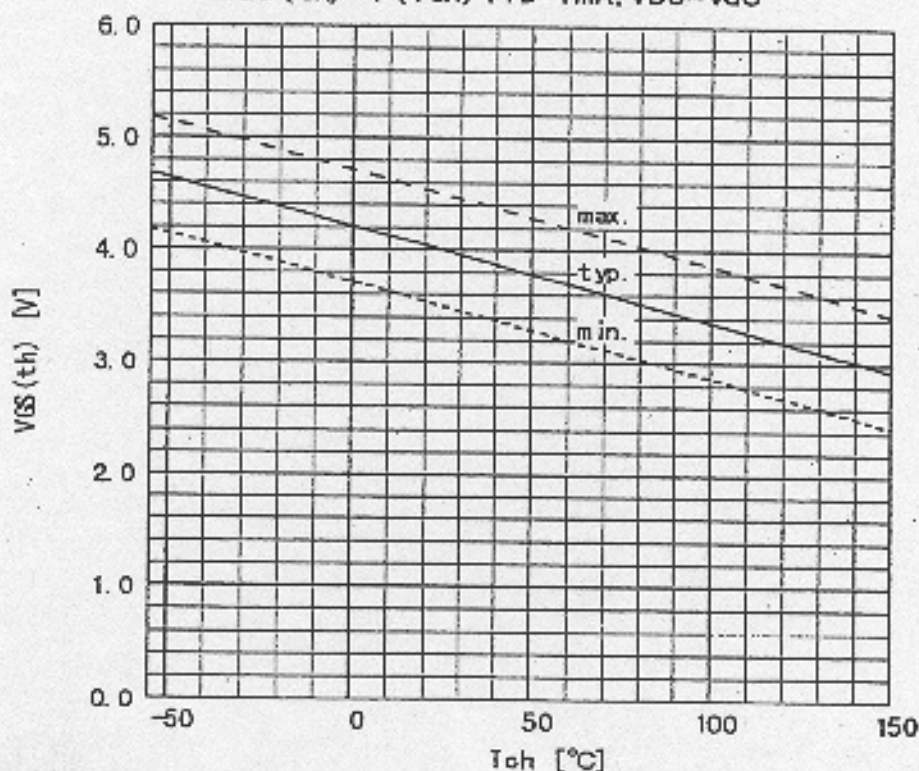
Drain-source on-state resistance

$$R_{DS(on)} = f(T_{ch}) : I_D = 9A, V_{GS} = 10V$$



Gate threshold voltage

$$V_{GS(th)} = f(T_{ch}) : I_D = 1mA, V_{DS} = V_{GS}$$



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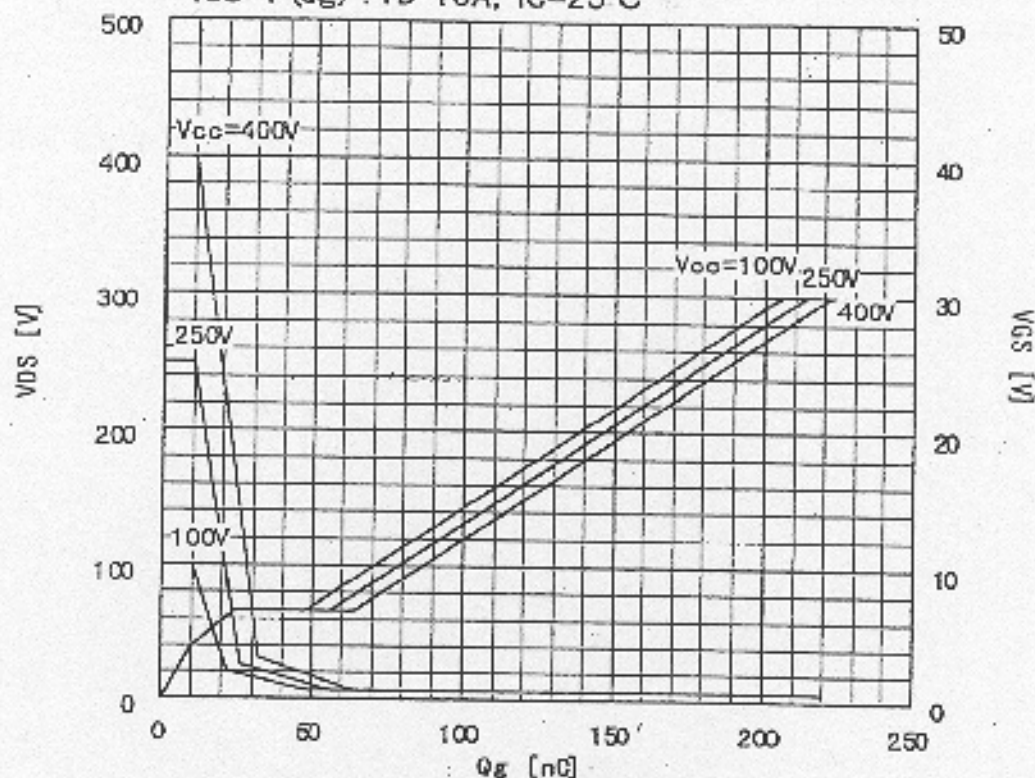
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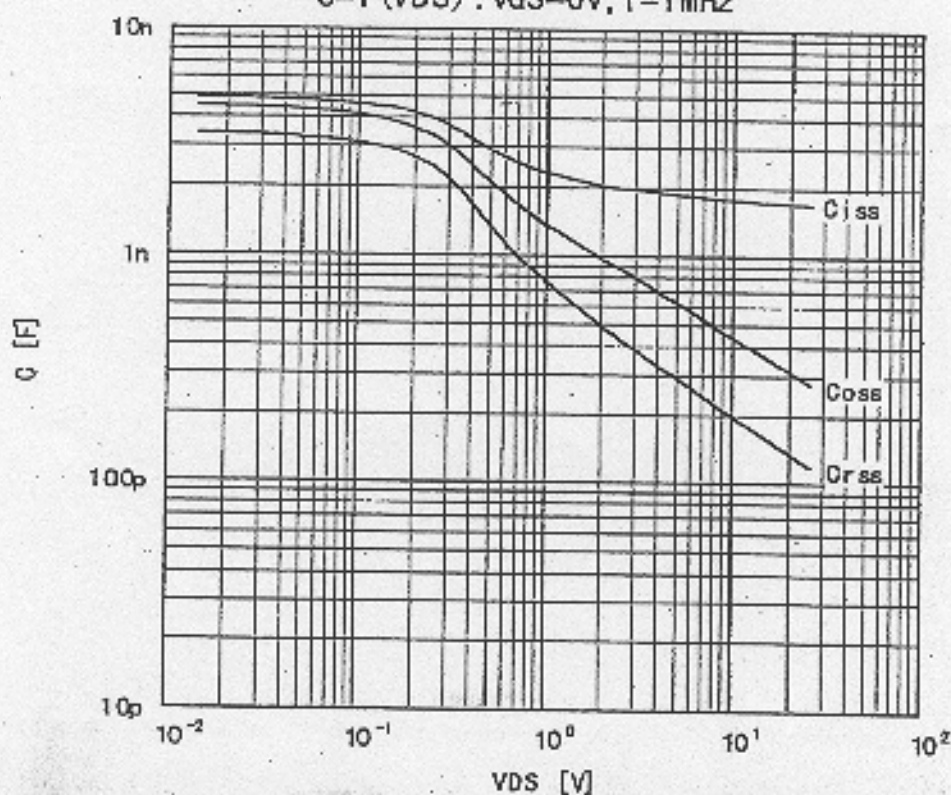
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Typical gate charge characteristic
 $V_{GS} = f(Q_g) : I_D = 18A, T_c = 25^\circ C$



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



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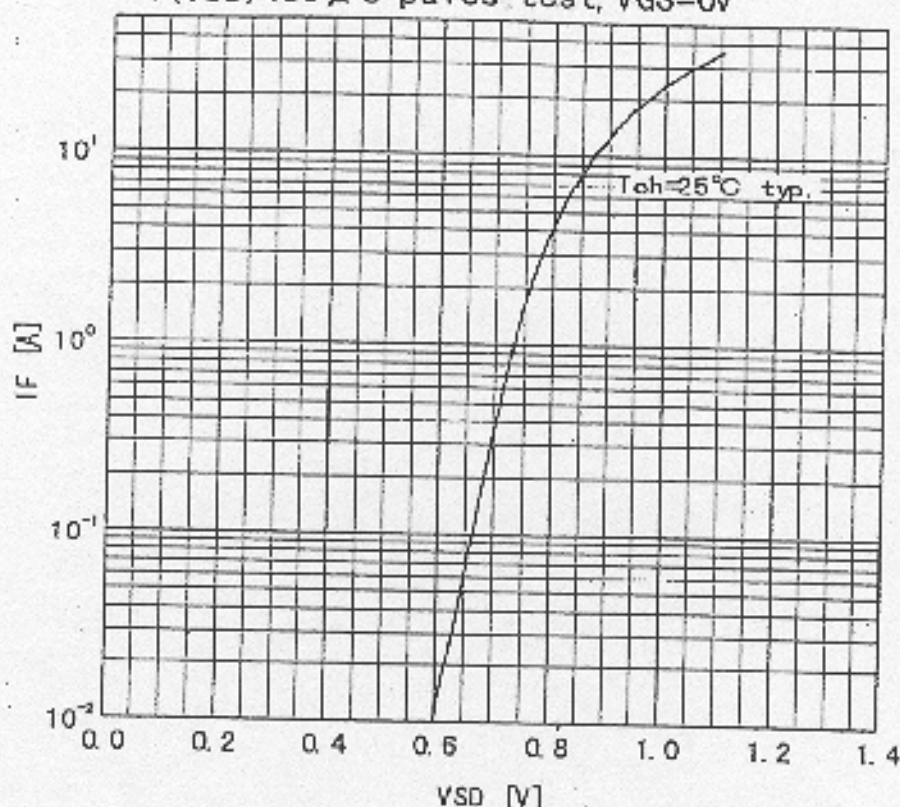
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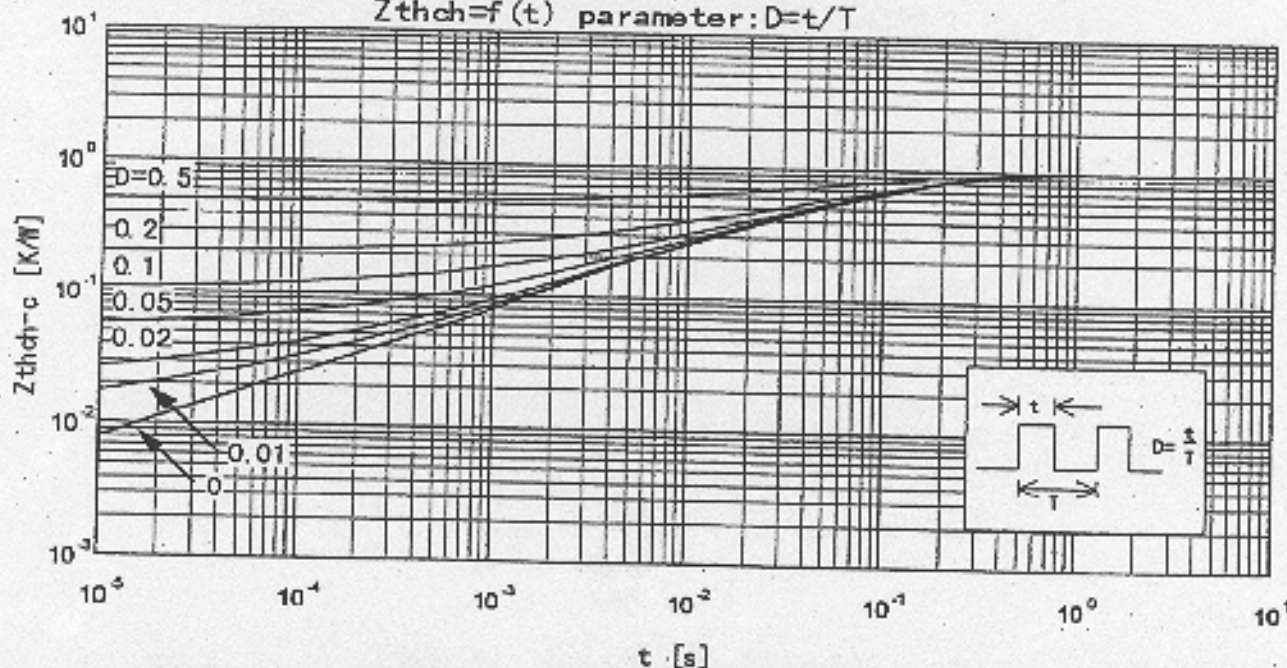
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Forward characteristic of reverse of diode
 $I_F = f(V_{SD})$: 80 μ s pulses test, $V_{GS} = 0V$



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



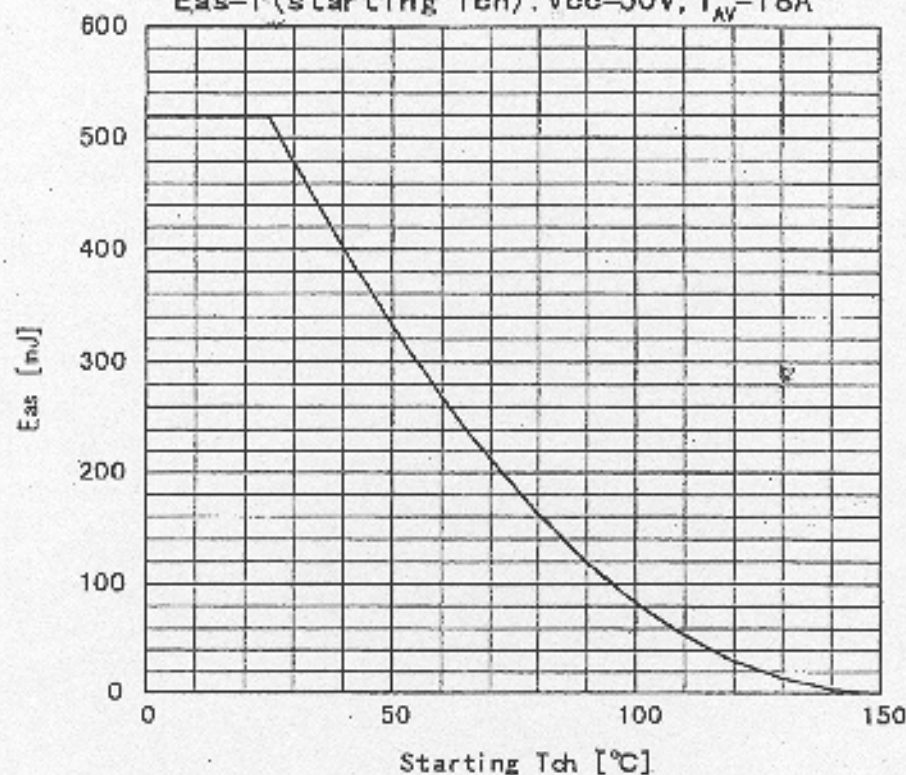
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Avalanche energy derating
 $E_{as}=f(\text{starting } T_{ch}): V_{CC}=50V, I_{AV}=18A$



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