

SPECIFICATION

(TENTATIVE)

Device Name : **Power MOSFET**

Type Name : **2SK3272-01L,S,SJ**

Spec. No. : **MS5F4394**

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Fuji Electric Co.,Ltd.
Matsumoto Factory

	DATE	NAME	APPROVED	Fuji Electric Co.,Ltd.	
DRAWN	Aug. - 24 - '98	<i>T. Shimada</i>		DWG. NO. MS5F4394	1/15
CHECKED	Aug. - 24 - '98	<i>T. Yamada</i>			
			<i>T. Goto</i>		

H04-004-05

- 1.Scope** This specifies Fuji Power MOSFET 2SK3272-01L,S,SJ
- 2.Construction** N-Channel enhancement mode power MOSFET
- 3.Applications** for Switching
- 4.Outview** T-pack L-Type Outview See to 5/15 page
 S-Type Outview See to 6/15 page
 SJ-Type Outview See to 7/15 page

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

Description	Symbol	Characteristics	Unit	Remarks
Drain-Source Voltage	V_{DS}	60	V	
	V_{DSX}	40	V	$V_{GS}=-20V$
Continuous Drain Current	I_D	±80	A	
Pulsed Drain Current	I_{DP}	±320	A	
Gate-Source Voltage	V_{GS}	+30/-20	V	
Maximum Avalanche Energy	E_{AV}	613	mJ	*1
Maximum Power Dissipation	P_D	135	W	
Operating and Storage Temperature range	T_{ch}	150	°C	
	T_{stg}	-55 to +150	°C	

*1 L=0.13mH, Vcc=24V

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

Static Ratings

Description	Symbol	Conditions	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=1mA$ $V_{GS}=0V$	60	-	-	V
		$I_D=1mA$ $V_{GS}=-20V$	40	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$I_D=10mA$ $V_{DS}=V_{GS}$	2.5	3.0	3.5	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=60V$ $V_{GS}=0V$ $T_{ch}=25°C$	-	1.0	100	μA
		$T_{ch}=125°C$	-	10	500.0	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=+30V, -20V$ $V_{DS}=0V$	-	10	100	nA
Drain-Source On-State Resistance	$R_{DS(on)}$	$I_D=40A$ $V_{GS}=10V$	-	5.0	6.5	mΩ

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Dynamic Ratings

Description	Symbol	Conditions	min.	typ.	max.	Unit
Forward Transconductance	g_{fs}	$I_D=40A$ $V_{DS}=10V$	25	50	-	S
Input Capacitance	C_{iss}	$V_{DS}=25V$	-	9000	-	pF
Output Capacitance	C_{oss}	$V_{GS}=0V$	-	1250	-	
Reverse Transfer Capacitance	C_{rss}	$f=1MHz$	-	700	-	
Turn-On Time	$t_d(on)$	$V_{cc}=30V$	-	50	-	ns
	t_r	$V_{GS}=10V$	-	200	-	
Turn-Off Time	$t_d(off)$	$I_D=80A$	-	150	-	
	t_f	$R_G=10\Omega$	-	135	-	
Total Gate Charge	Q_g	$V_{cc}=30V$	-	145	-	ns
Gate - Source Charge	Q_{gs}	$I_D=80A$	-	60	-	
Gate - Drain Charge	Q_{gd}	$V_{GS}=10V$	-	40	-	

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	80	-	-	A
Diode Forward On-Voltage	V_{SD}	$I_F=80A$ $V_{GS}=0V$ $T_{ch}=25^\circ C$	-	1.0	1.5	V
Reverse Recovery Time	t_{rr}	$I_F=50A$ $V_{GS}=0V$	-	85	-	ns
Reverse Recovery Charge	Q_{rr}	$-di/dt=100A/\mu s$ $T_{ch}=25^\circ C$	-	0.25	-	μC

7.Thermal Resistance

Description	Symbol	min.	typ.	max.	Unit
Channel to Case	$R_{th}(ch-c)$	-	-	0.926	$^\circ C/W$
Channel to Ambient	$R_{th}(ch-a)$	-	-	75.0	$^\circ C/W$

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Fig.1 Test circuit

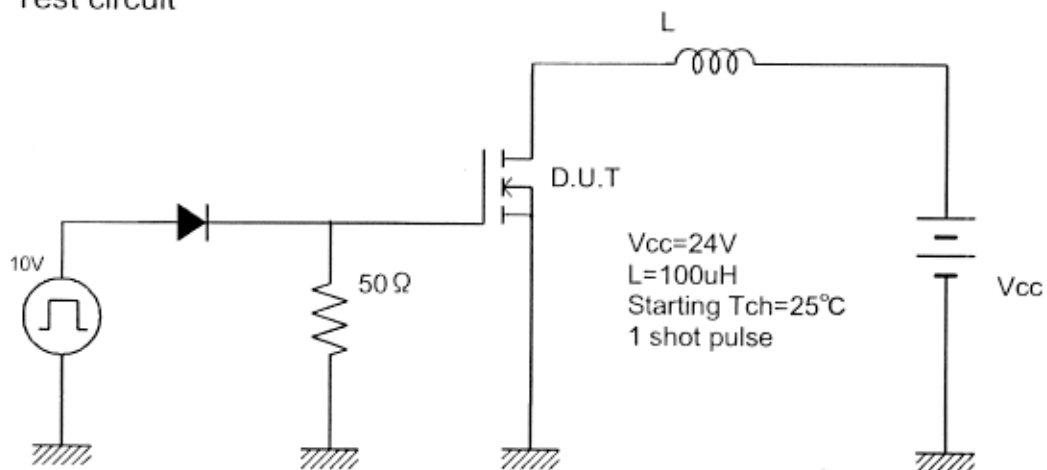
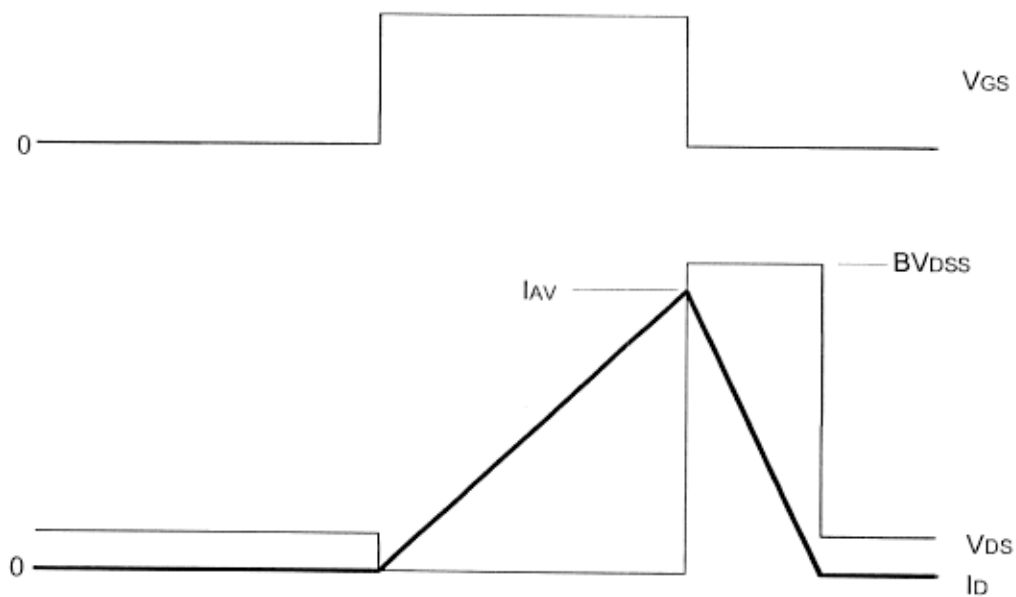
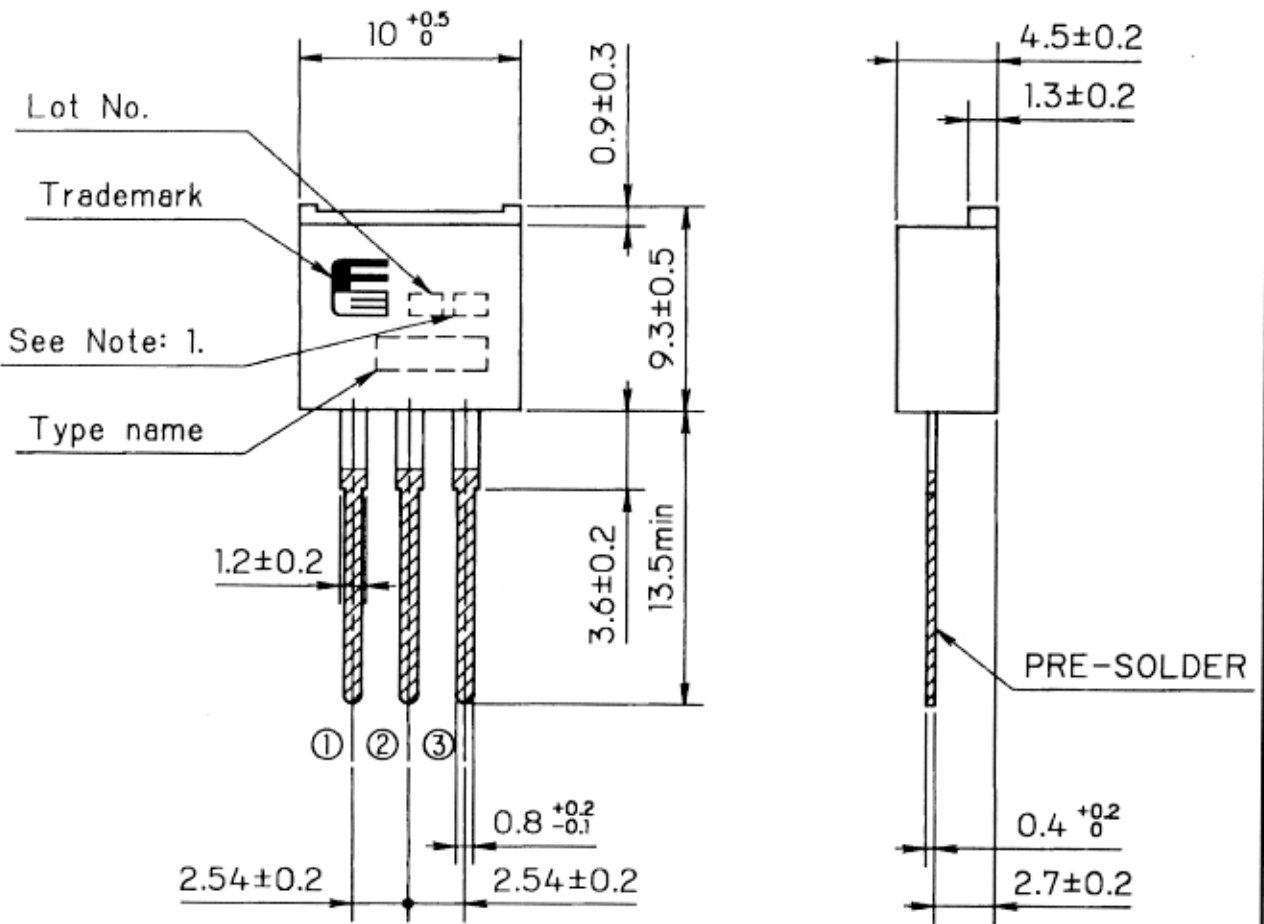


Fig.2 Operating waveforms



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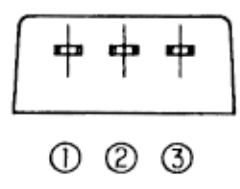
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Trademark

See Note: 1.

Type name

PRE-SOLDER



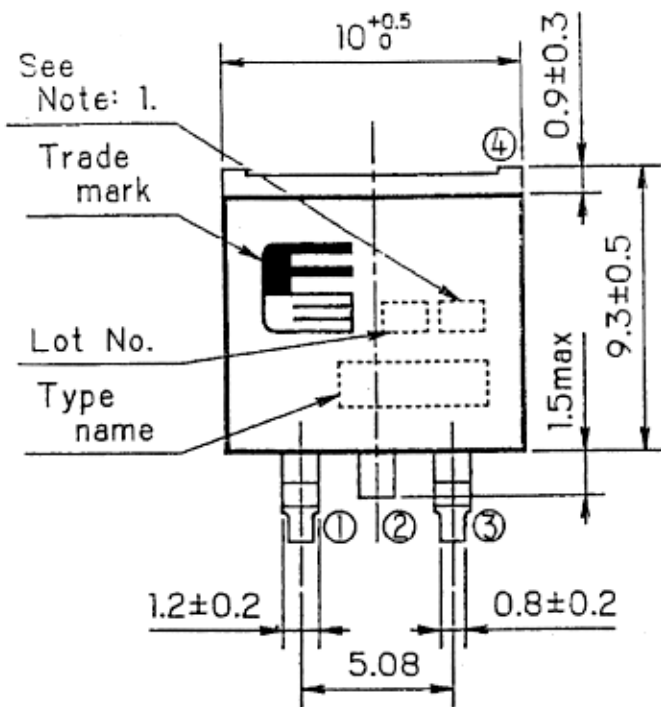
CONNECTION

- ① GATE
- ② DRAIN
- ③ SOURCE

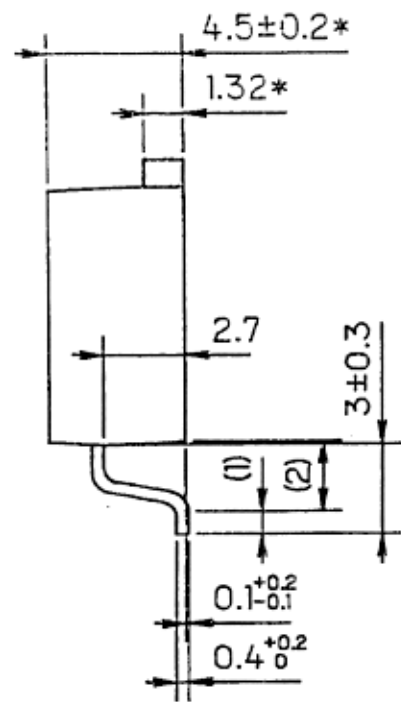
Note: 1. Guaranteed mark of avalanche ruggedness.

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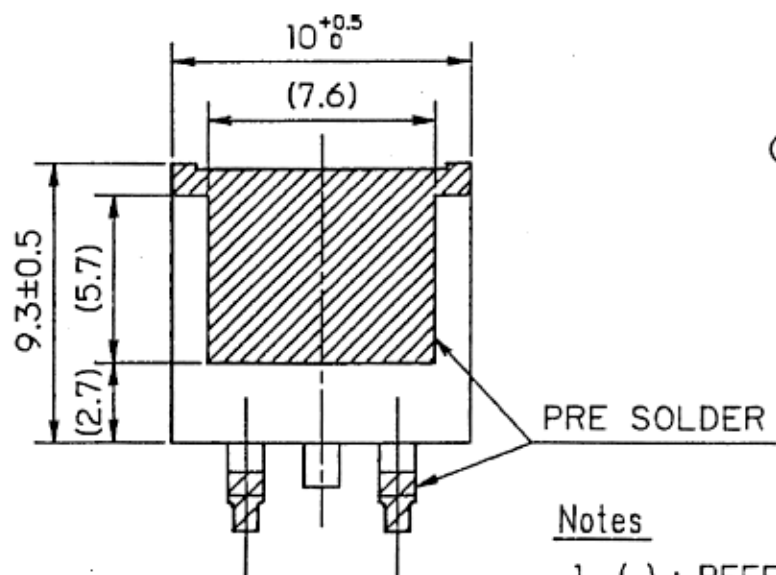


BOTTOM VIEW



CONNECTION

- ① GATE
- ④ ② DRAIN
- ③ SOURCE



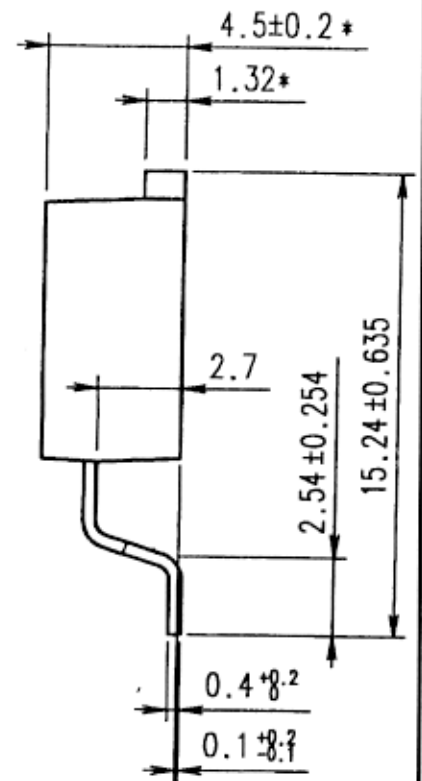
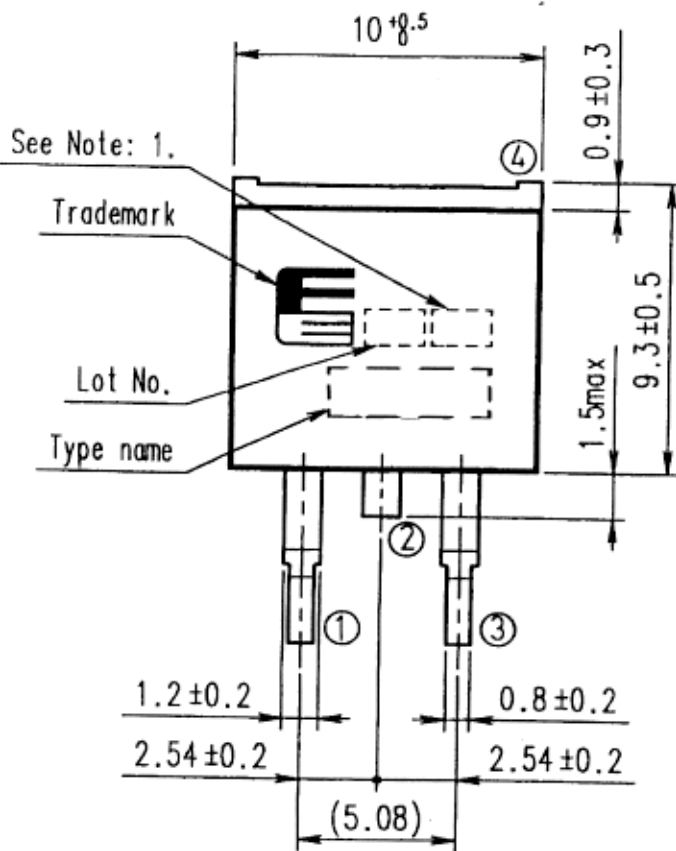
Notes

Note: 1. Guaranteed mark of avalanche ruggedness.

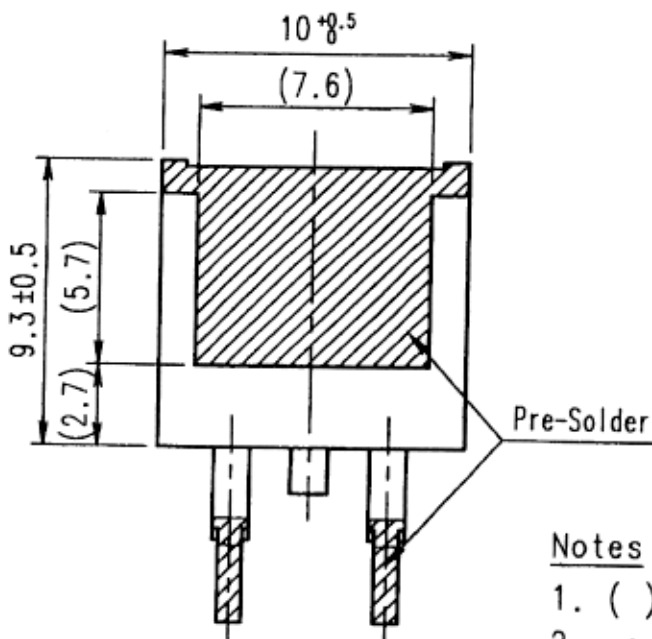
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- 2. * : DO NOT INCLUDE SOLDER.

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BOTTOM VIEW



CONNECTION

- ① GATE
- ④ ② DRAIN
- ③ SOURCE

Notes

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2. * : DO NOT INCLUDE SOLDER.

Note: 1. Guaranteed mark of avalanche ruggedness.

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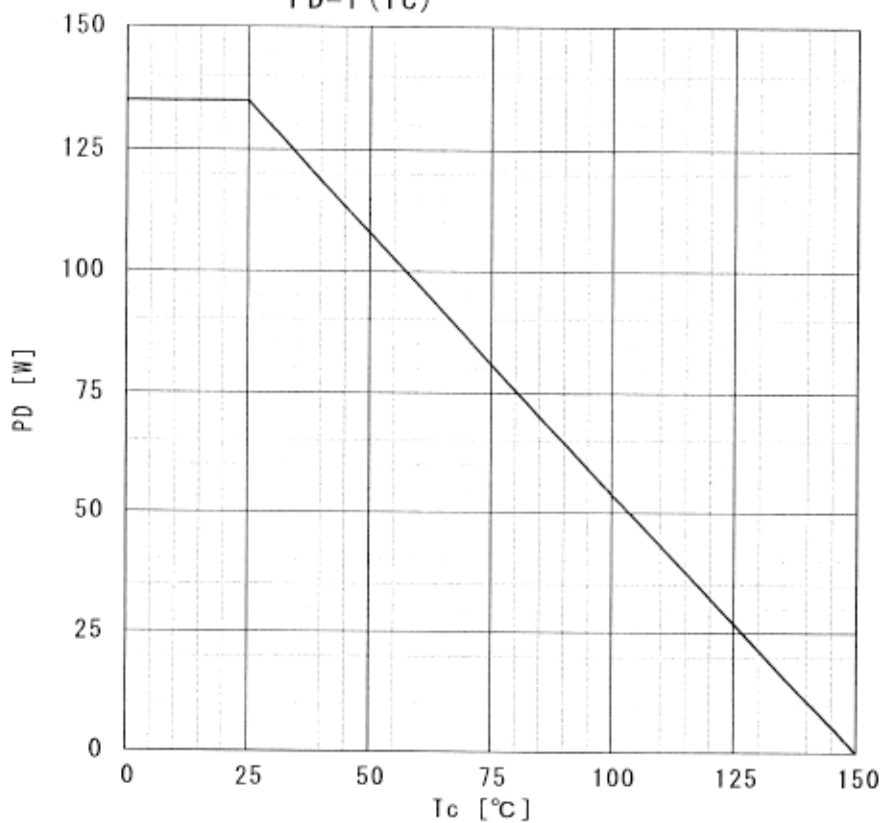
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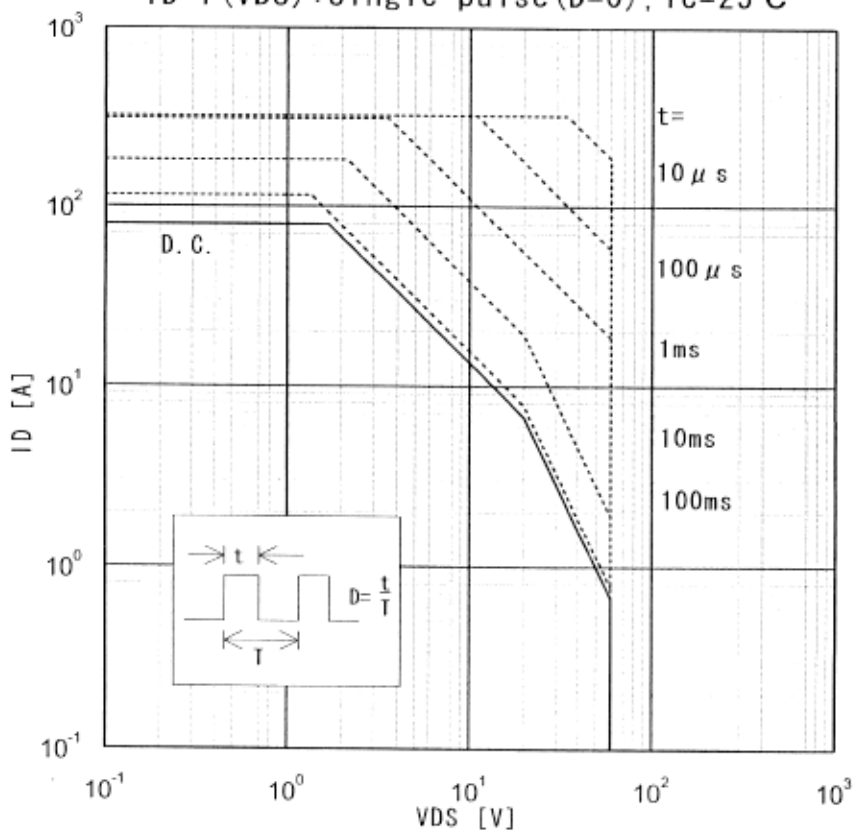
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Power Dissipation PD=f(Tc)



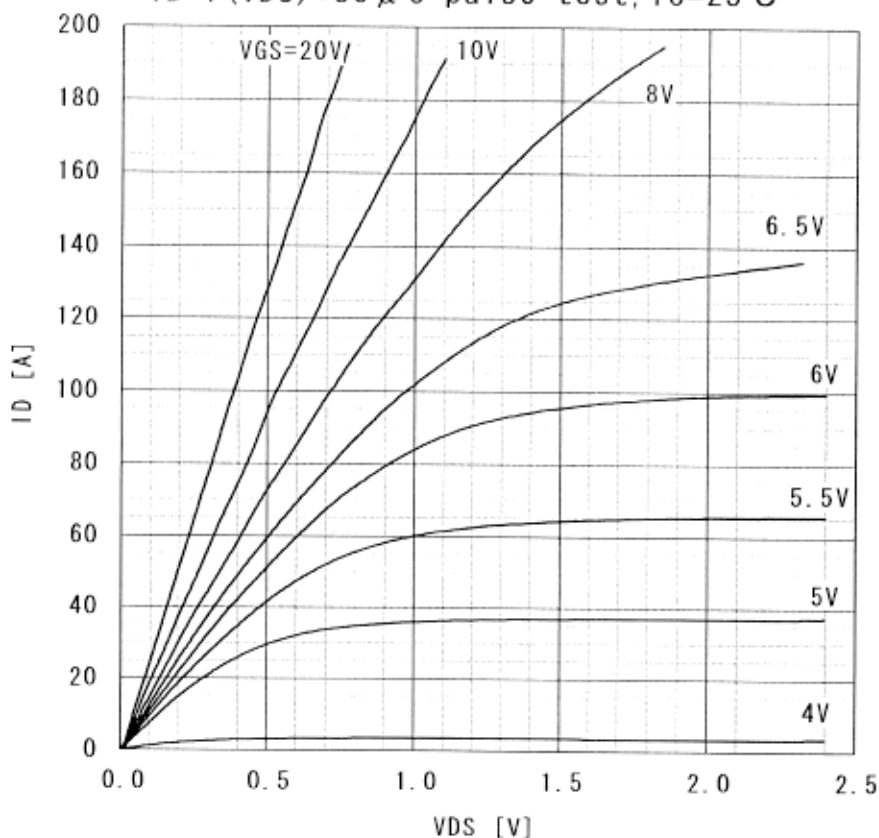
Safe operating area

ID=f(VDS) : Single pulse (D=0), Tc=25°C

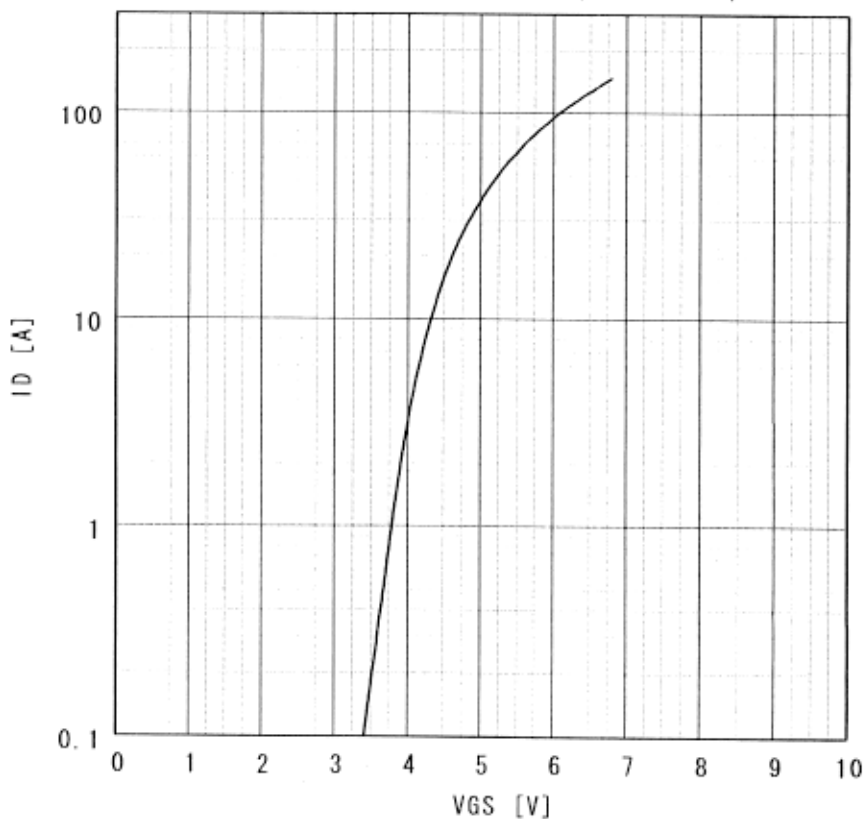


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Typical output characteristics
 $I_D = f(V_{DS}) : 80 \mu s$ pulse test, $T_c = 25^\circ C$



Typical transfer characteristics
 $I_D = f(V_{GS}) : 80 \mu s$ pulse test, $V_{DS} = 10V$, $T_{ch} = 25^\circ C$



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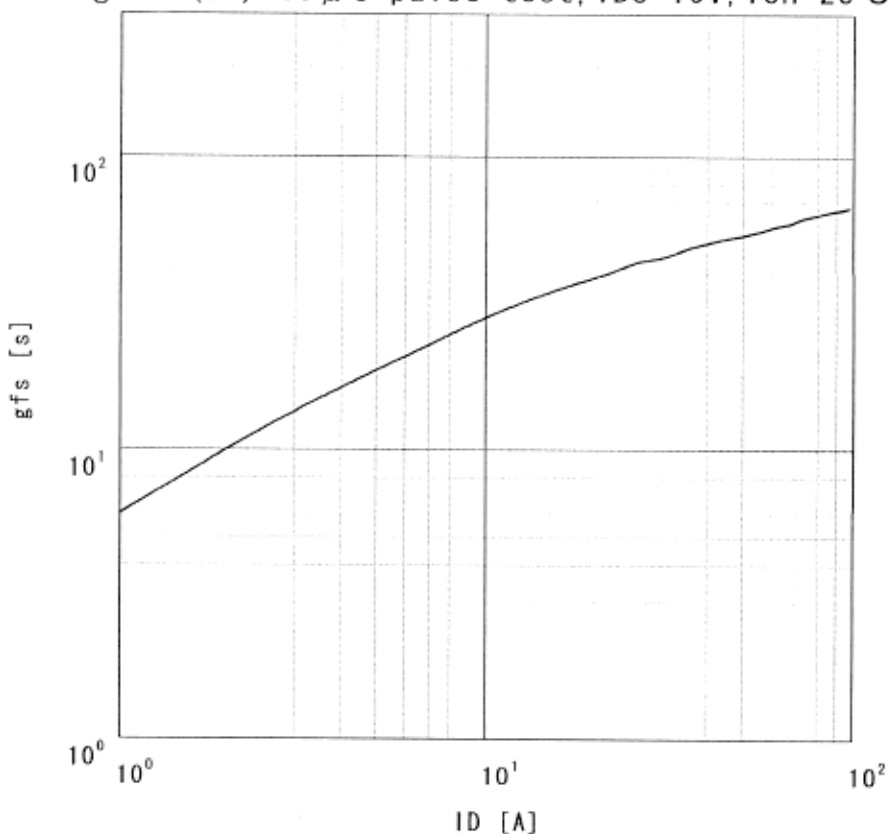
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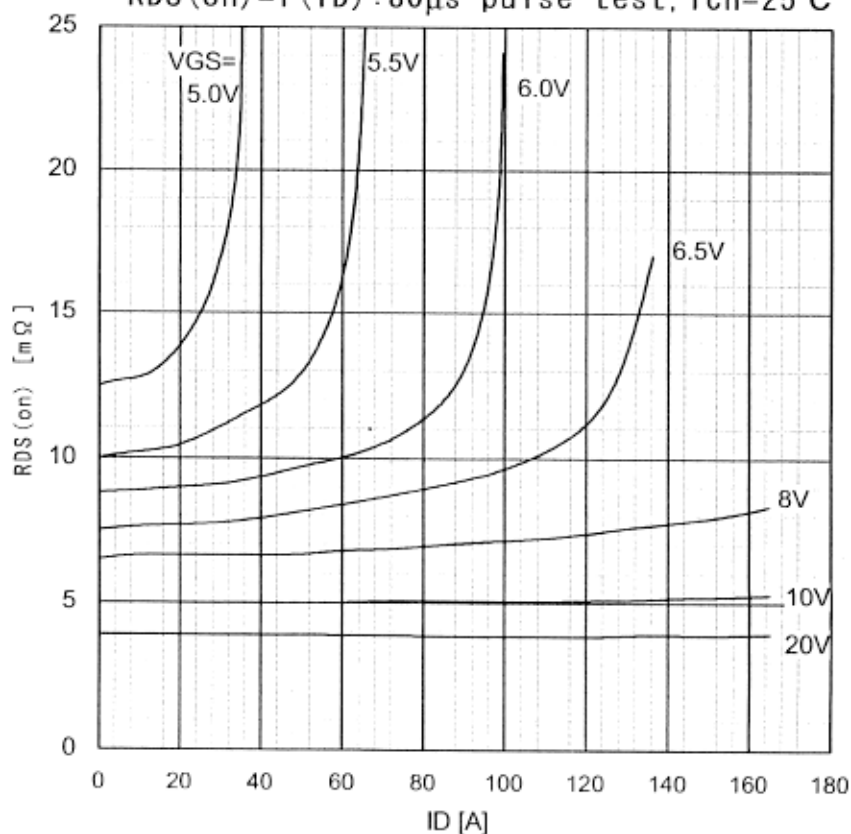
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Typical forward transconductance
 $g_{fs} = f(I_D) : 80 \mu s$ pulse test, $V_{DS} = 10V$, $T_{ch} = 25^\circ C$



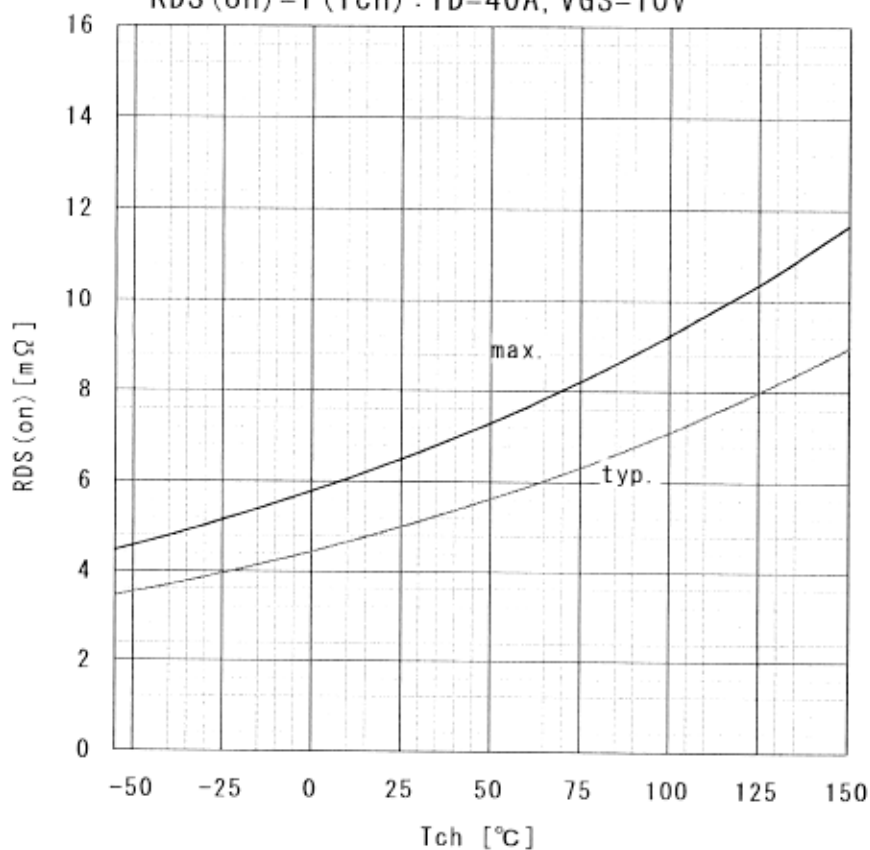
Typical Drain-Source on-State Resistance
 $R_{DS(on)} = f(I_D) : 80 \mu s$ pulse test, $T_{ch} = 25^\circ C$



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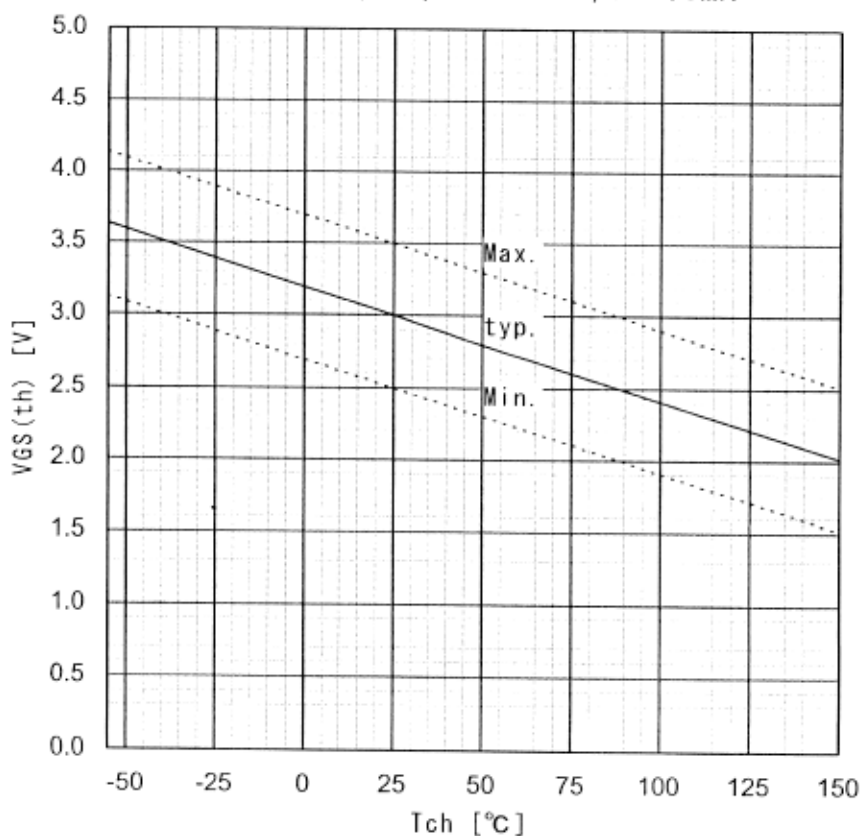
Drain-source on-state resistance

$$R_{DS(on)} = f(T_{ch}) : I_D = 40A, V_{GS} = 10V$$

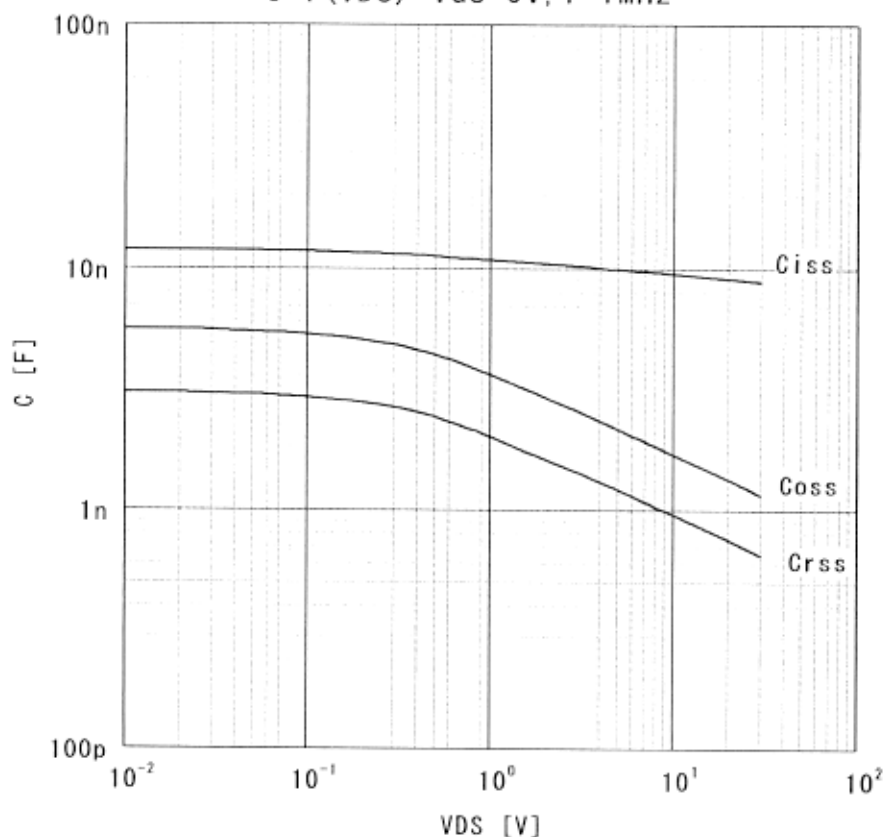


Gate Threshold Voltage vs. T_{ch}

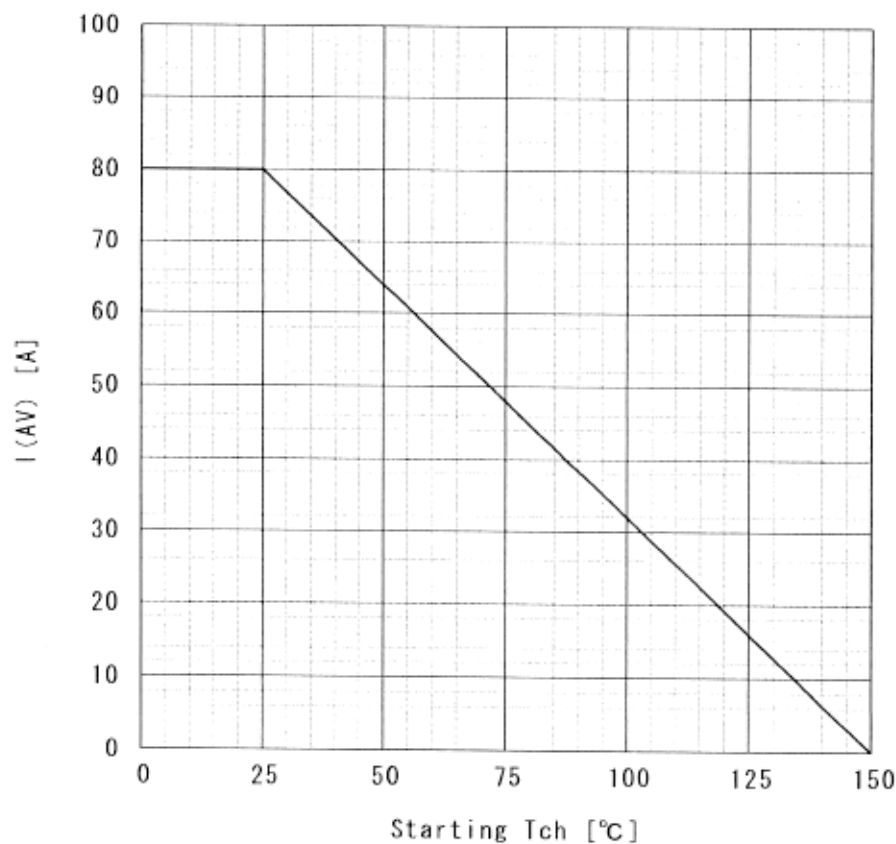
$$V_{GS(th)} = f(T_{ch}) : V_{DS} = V_{GS}, I_D = 10mA$$



Typical capacitances
 $C=f(VDS) : VGS=0V, f=1MHz$



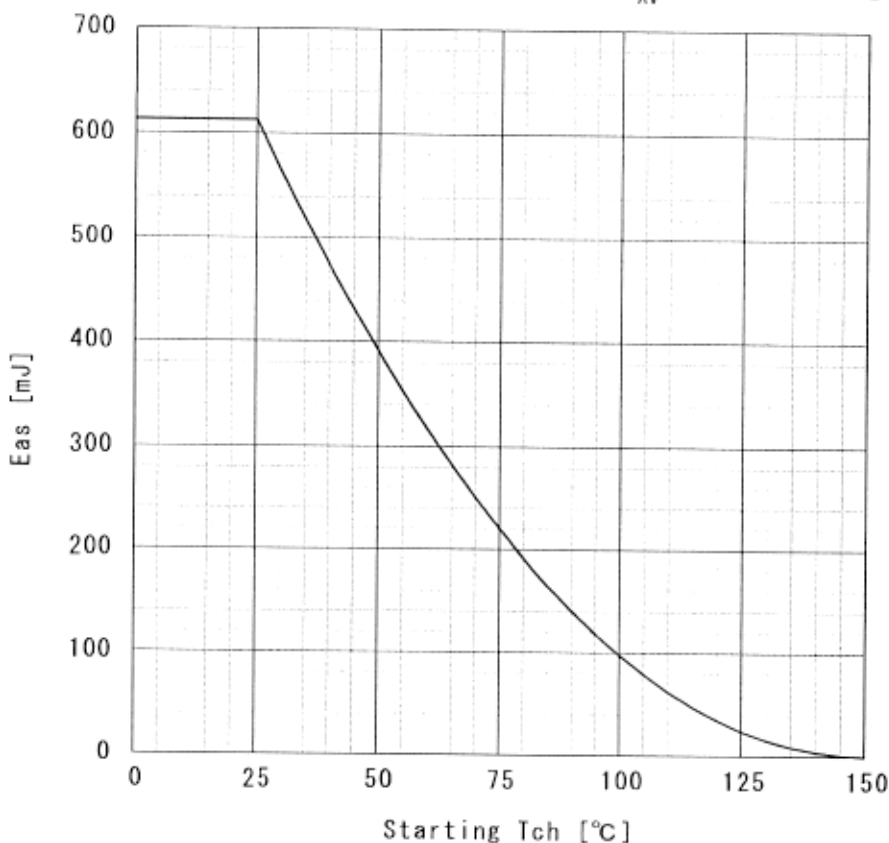
Maximum Avalanche Current vs. starting Tch
 $I(AV)=f(\text{starting Tch})$, single pulse



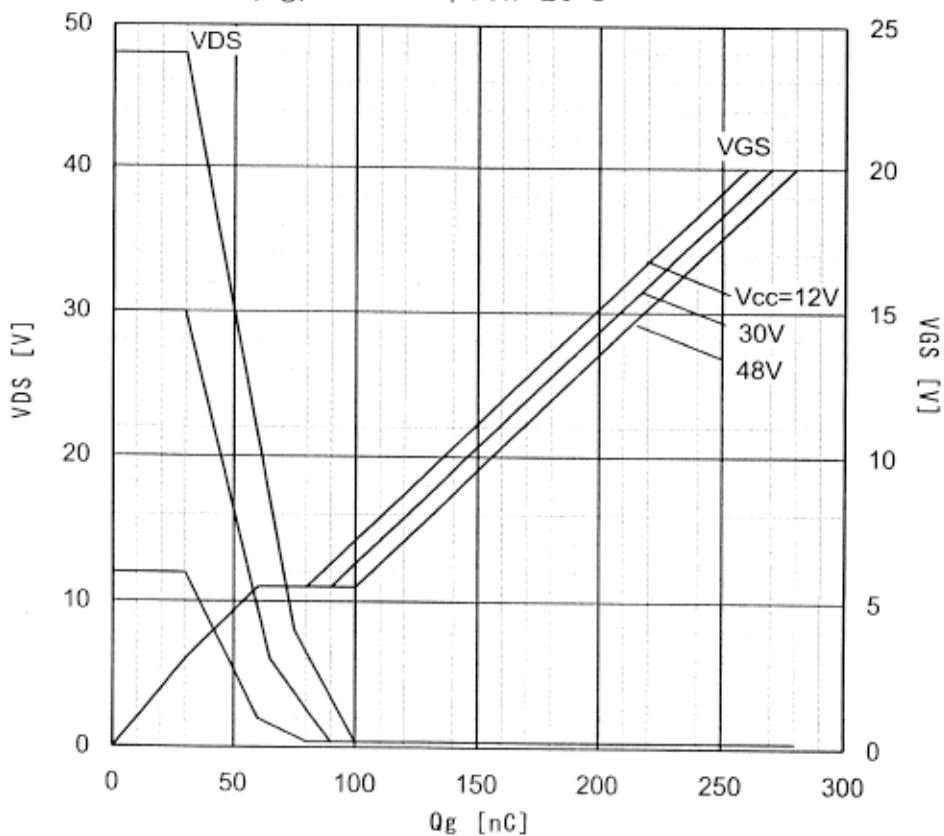
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Maximum Avalanche energy vs. starting Tch
 $E_{as}=f(\text{starting Tch}) : V_{cc}=24V, I_{AV} \leq 80A$, single pulse

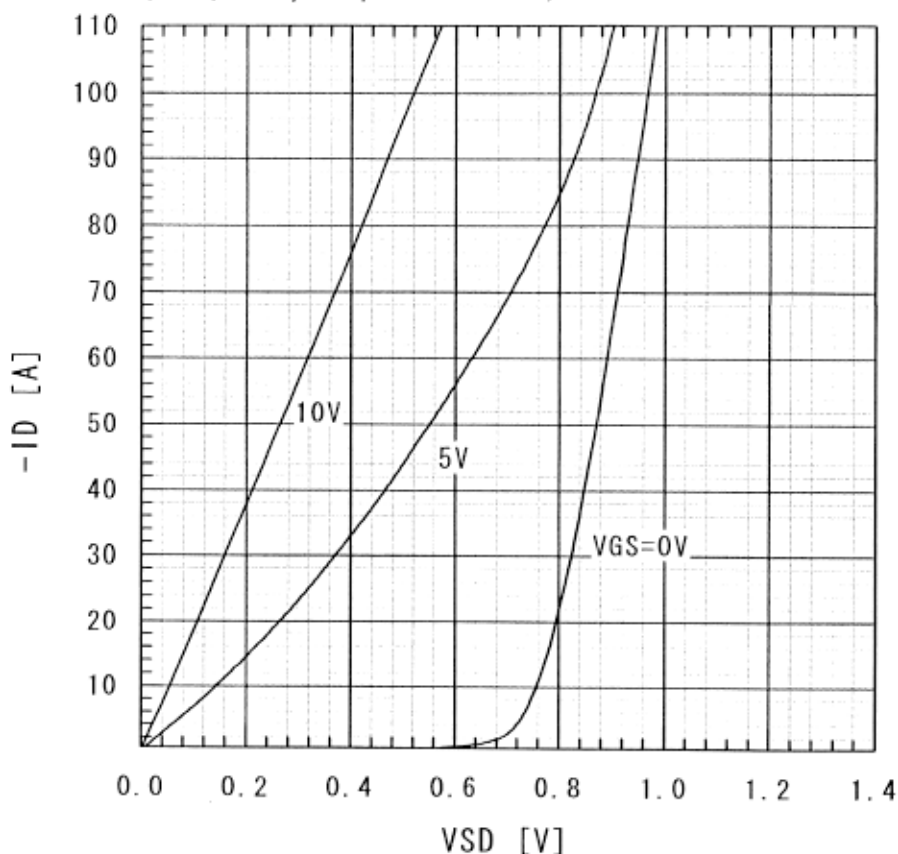


Typical Gate Charge Characteristics
 $V_{GS}=f(Q_g) : I_D=80A, Tch=25^\circ C$

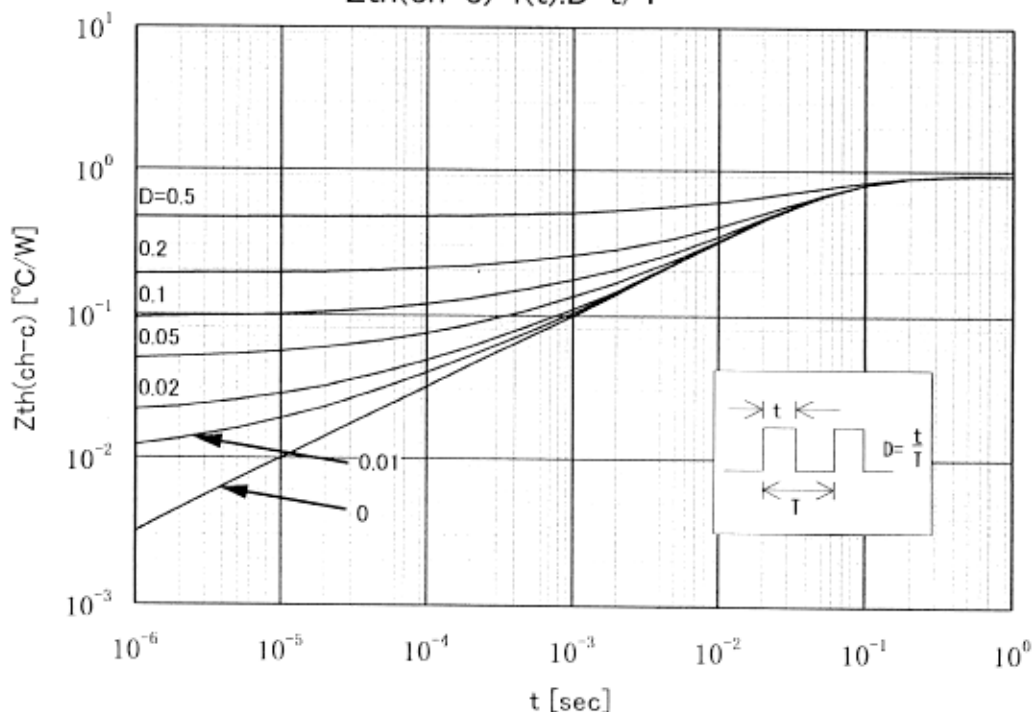


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Typical Forward Characteristics of Reverse Diode
 $-I_D = f(V_{SD}) : 80 \mu s$ pulse test, $T_{ch} = 25^\circ C$

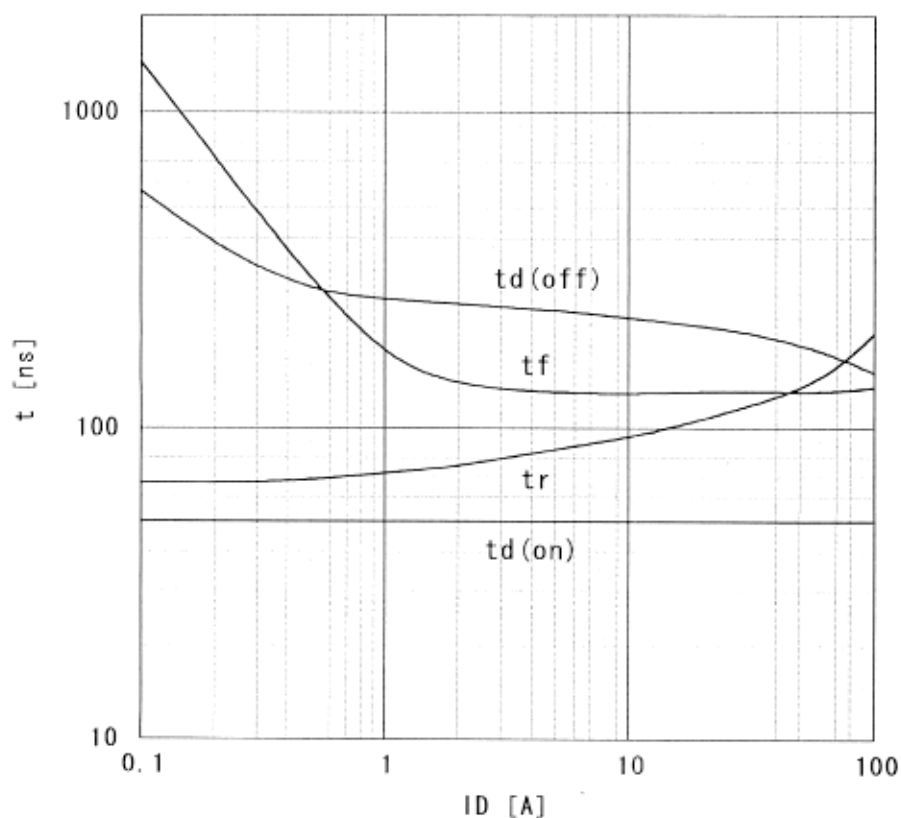


Transient Thermal Impedance
 $Z_{th(ch-c)} = f(t) : D = t/T$



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Typical Switching Characteristics vs. I_D
 $t = f(I_D) : V_{CC} = 30V, V_{GS} = 10V, R_G = 10\Omega$



Drain-Source Breakdown Voltage vs. V_{GS}
 $BV_{DSX} = f(V_{GS}) : T_{ch} = 25^\circ C$

