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SPECIFICATION

Device Name : Power MOSFET
Type Name : 2SK3272-01L, S, SJ
Spec. No. :

	DATE	NAME	APPROVED	Fuji Electric Co.,Ltd.		
DRAWN	Aug. - 24 - '98			DWG. NO.	1 of 15	
CHECKED						

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 (unless otherwise specified)

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

*1 L=0.13mH, Vcc=24V

6.Electrical Characteristics at Tc=25 (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
	BV_{DSX}	$I_D=1mA$ $V_{GS}=-30V$	30	-	-	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}	$V_{DS}=60V$ $T_{ch}=25$	-	1.0	100	μA
		$V_{GS}=0V$ $T_{ch}=125$	-	10	500.0	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V$ $V_{DS}=0V$	-	10	100	nA
Drain-Source On-State Resistance	$R_{DS(on)}$	$I_D=40A$ $V_{GS}=10V$	-	5.0	6.5	m Ω

Dynamic Ratings

Description	Symbol	Conditions	min.	typ.	max.	Unit
Forward Transconductance	g_{fs}	$I_D=40A$ $V_{DS}=10V$	25	50	-	S
Input Capacitance	Ciss	$V_{DS}=25V$ $V_{GS}=0V$ $f=1MHz$	-	9000	-	pF
Output Capacitance	Coss		-	1250	-	
Reverse Transfer Capacitance	Crss		-	700	-	
Turn-On Time	td(on)	$V_{cc}=30V$	-	50	-	ns
	tr	$V_{GS}=10V$	-	200	-	
Turn-Off Time	td(off)	$I_D=80A$	-	150	-	
	tf	$R_G=10\Omega$	-	135	-	

Reverse Diode

Description	Symbol	Conditions	min.	typ.	max.	Unit
Avalanche Capability	I_{AV}	$L=100\mu H$ $T_{ch}=25$ See Fig.1 and Fig.2	80	-	-	A
Diode Forward On-Voltage	V_{SD}	$I_F=80A$ $V_{GS}=0V$ $T_{ch}=25$	-	1.0	1.5	V
Reverse Recovery Time	trr	$I_F=50A$ $V_{GS}=0V$	-	85	-	ns
Reverse Recovery Charge	Qrr	$-di/dt=100A/\mu s$ $T_{ch}=25$	-	0.25	-	μC

7.Thermal Resistance

Description	Symbol	min.	typ.	max.	Unit
Channel to Case	Rth(ch-c)	-	-	0.926	/W
Channel to Ambient	Rth(ch-a)	-	-	75.0	/W

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Fig.1 Test circuit

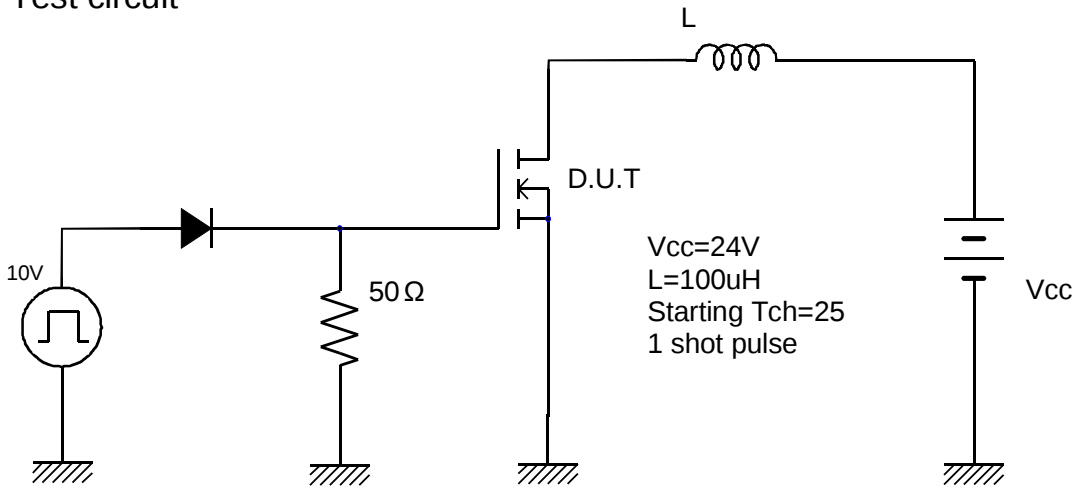
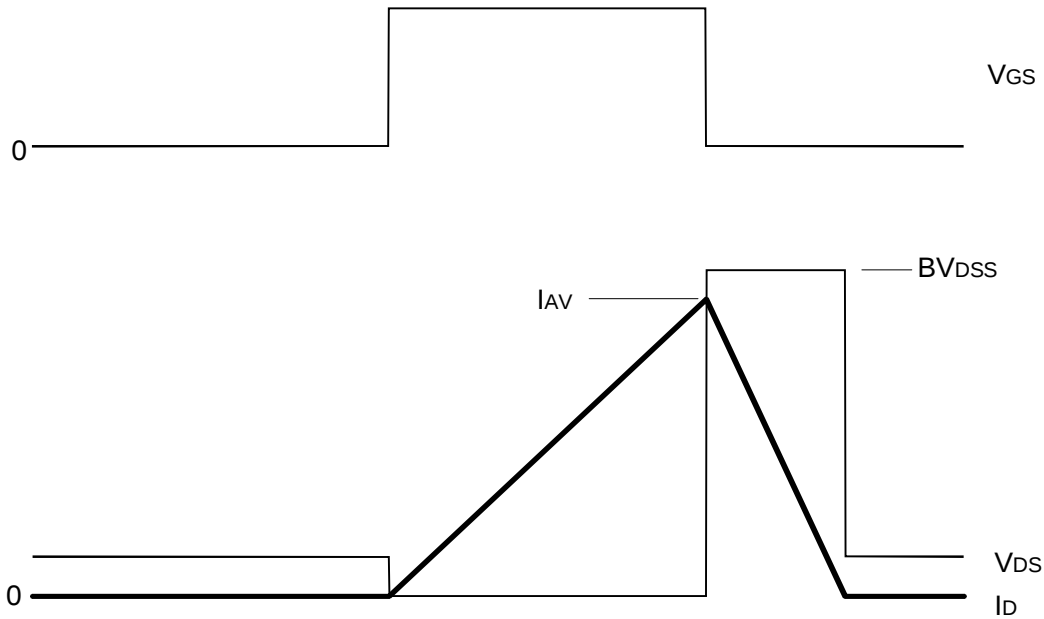
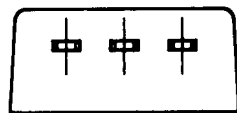
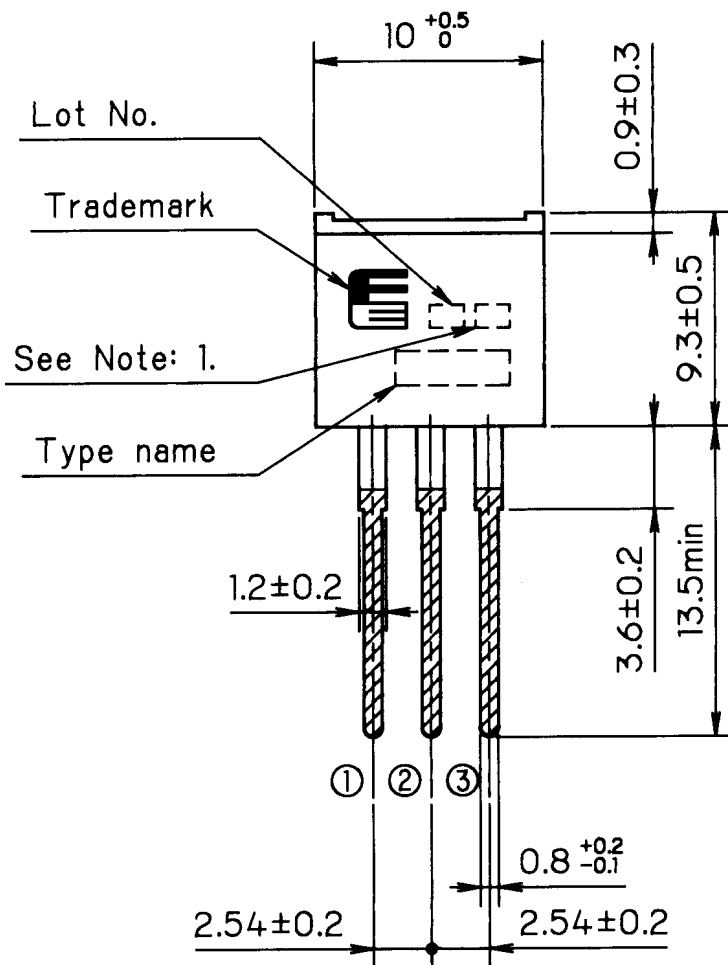
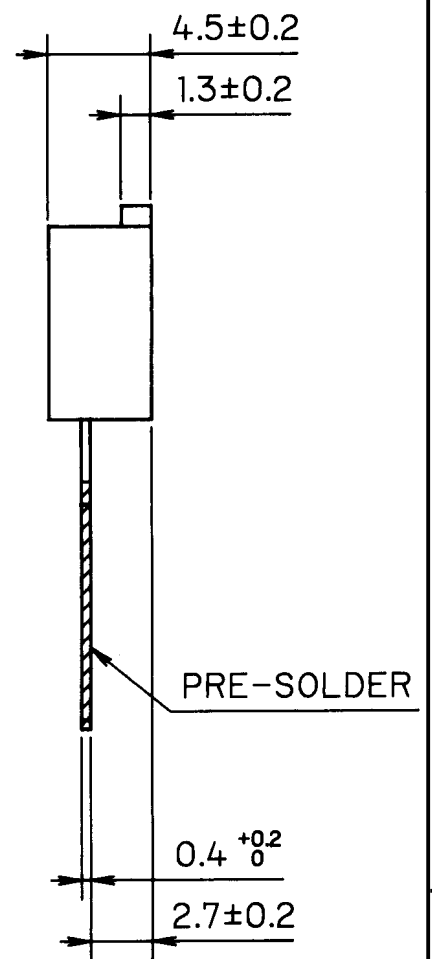


Fig.2 Operating waveforms





① ② ③

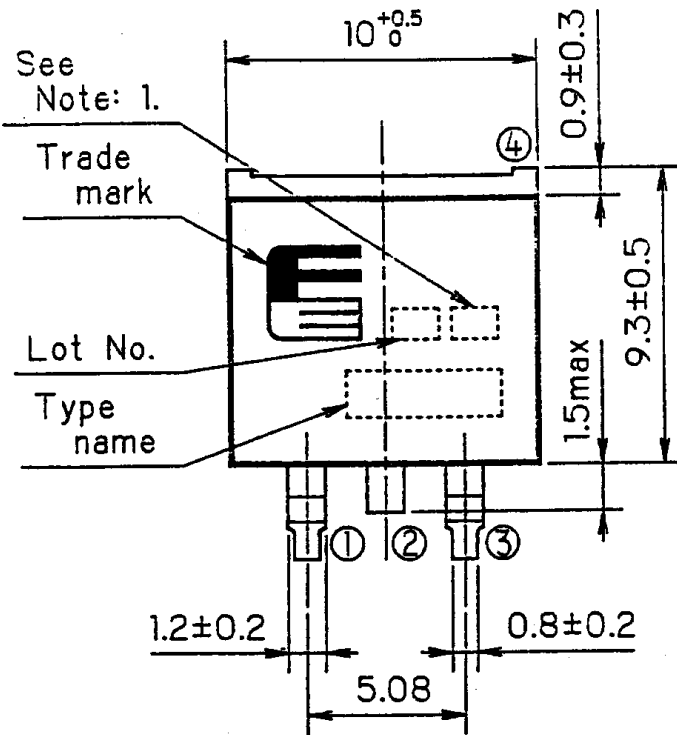


CONNECTION

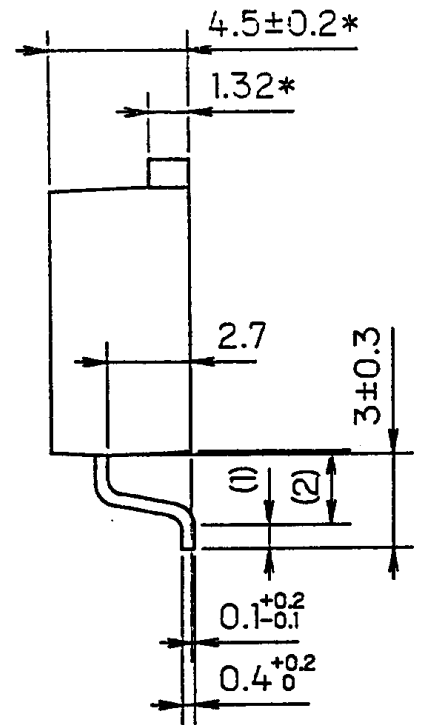
- ① GATE
- ② DRAIN
- ③ SOURCE

Note: 1. Guaranteed mark of avalanche ruggedness.

DIMENSIONS ARE IN MILLIMETERS.

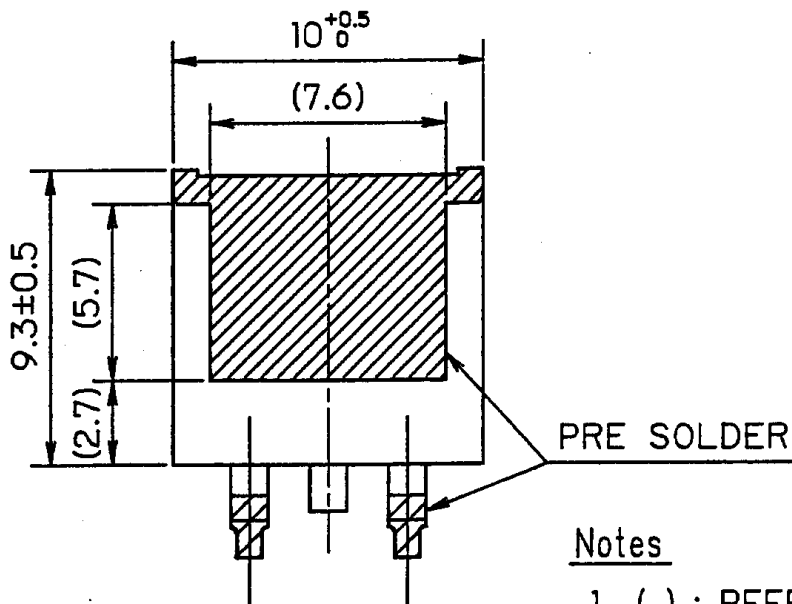


BOTTOM VIEW



CONNECTION

- ① GATE
- ④ ② DRAIN
- ③ SOURCE

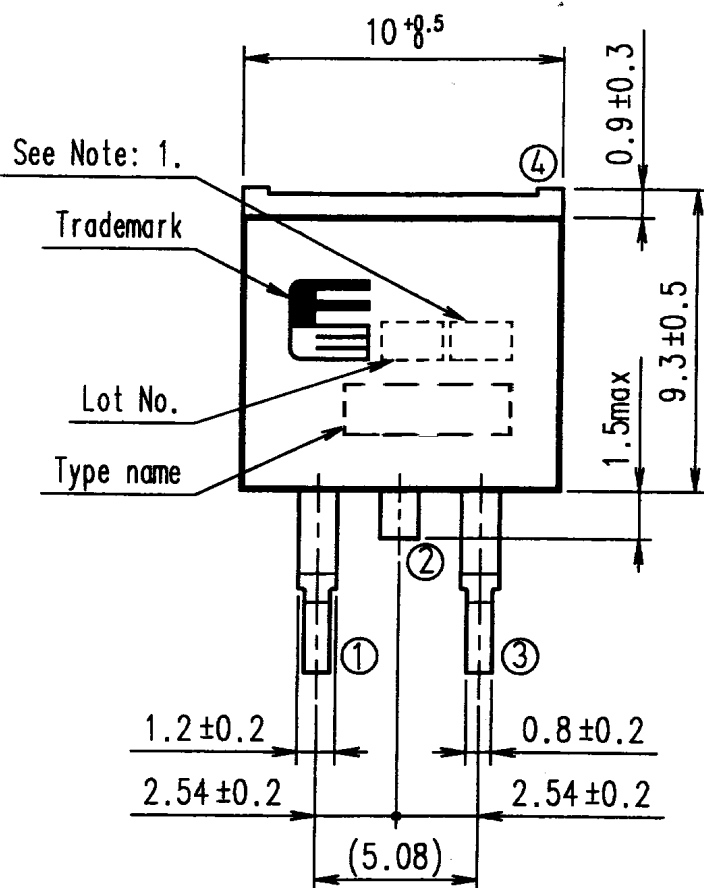


Notes

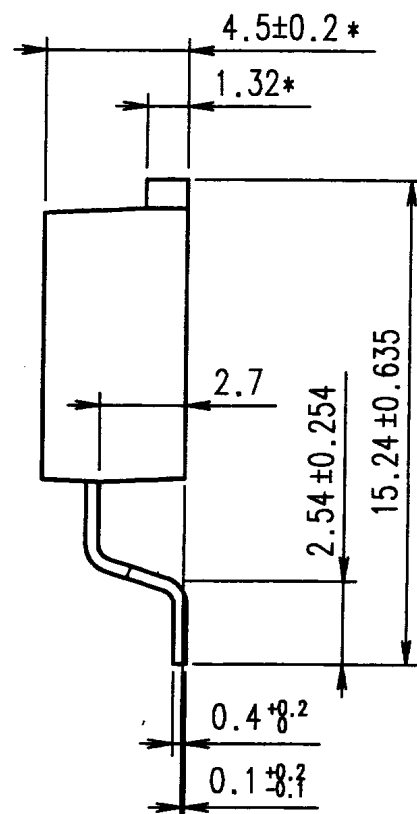
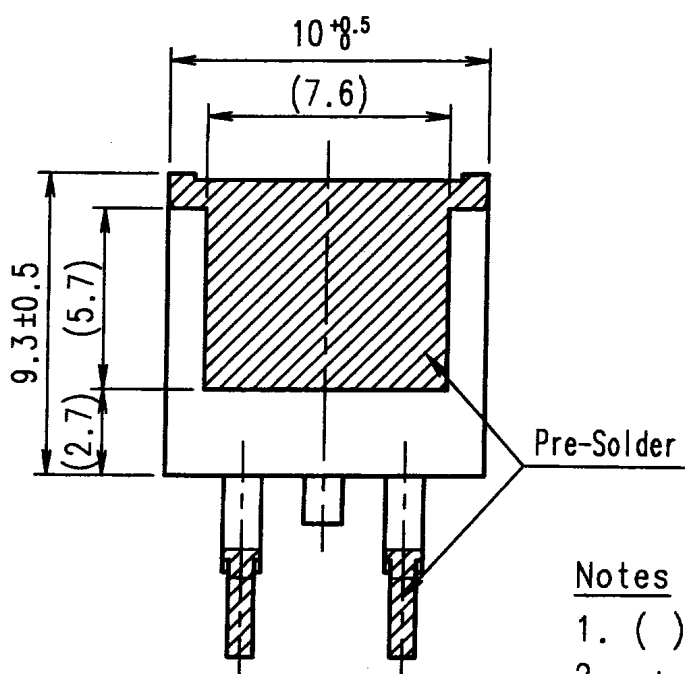
Note: 1. Guaranteed mark of avalanche ruggedness.

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

DIMENSIONS ARE IN MILLIMETERS.



BOTTOM VIEW



CONNECTION

- ① GATE
- ④ ② DRAIN
- ③ SOURCE

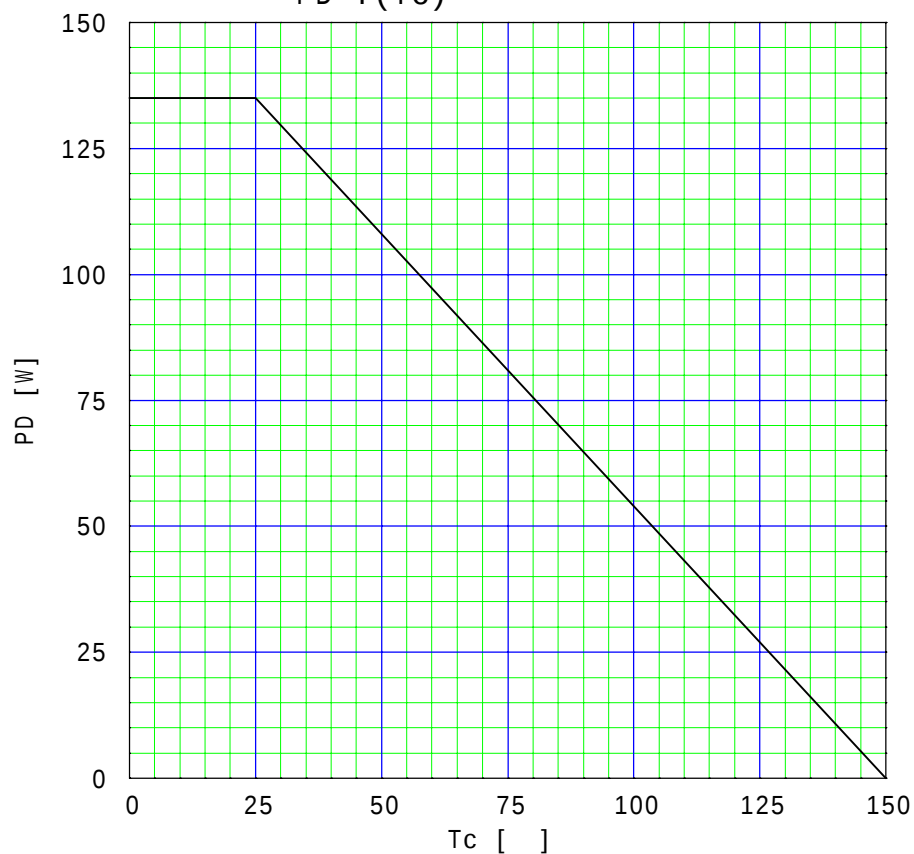
Notes

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

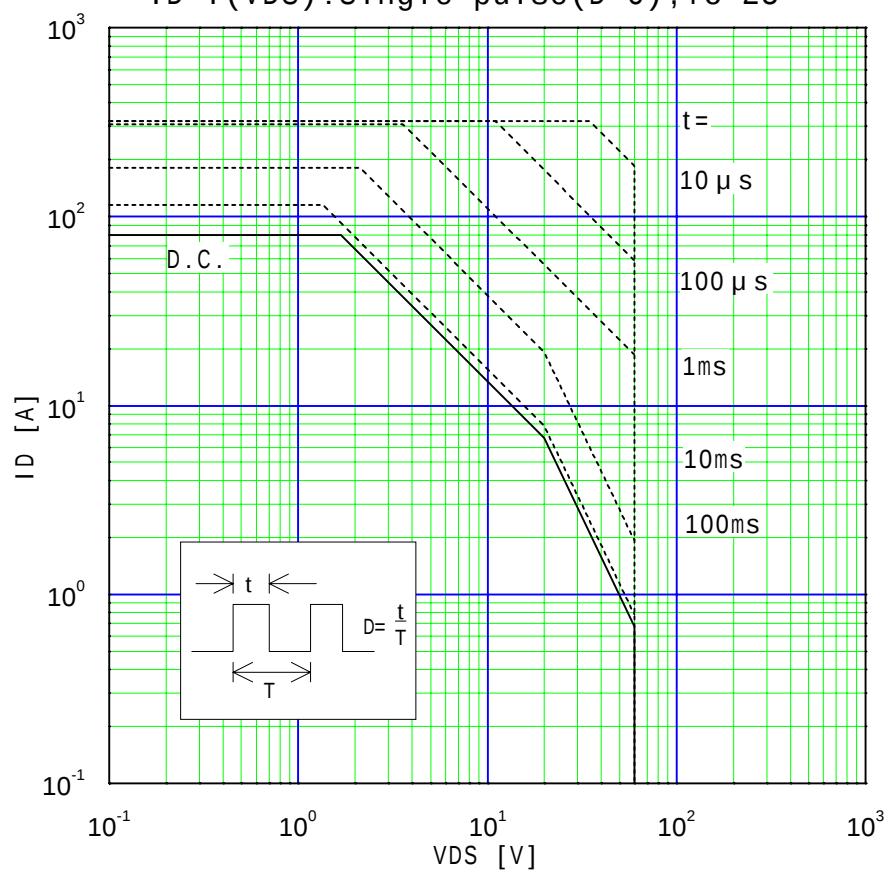
Note: 1. Guaranteed mark of avalanche ruggedness.

DIMENSIONS ARE IN MILLIMETERS.

Power Dissipation $PD=f(T_c)$



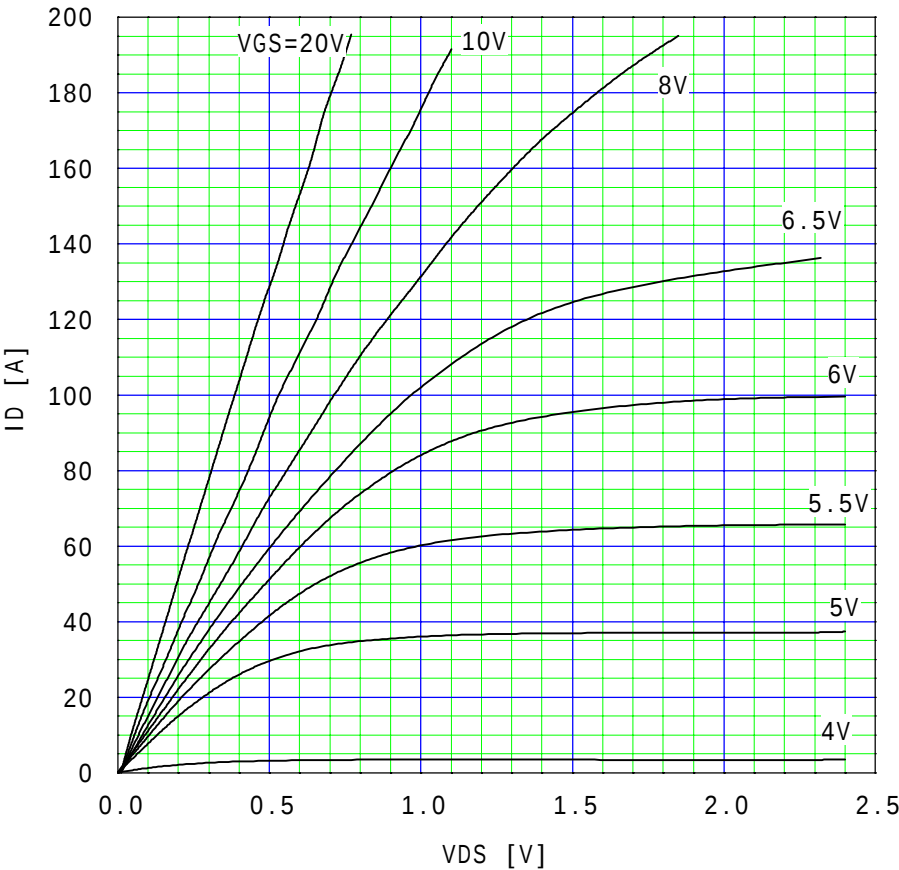
Safe operating area $ID=f(V_{DS}): \text{Single pulse}(D=0), T_c=25$



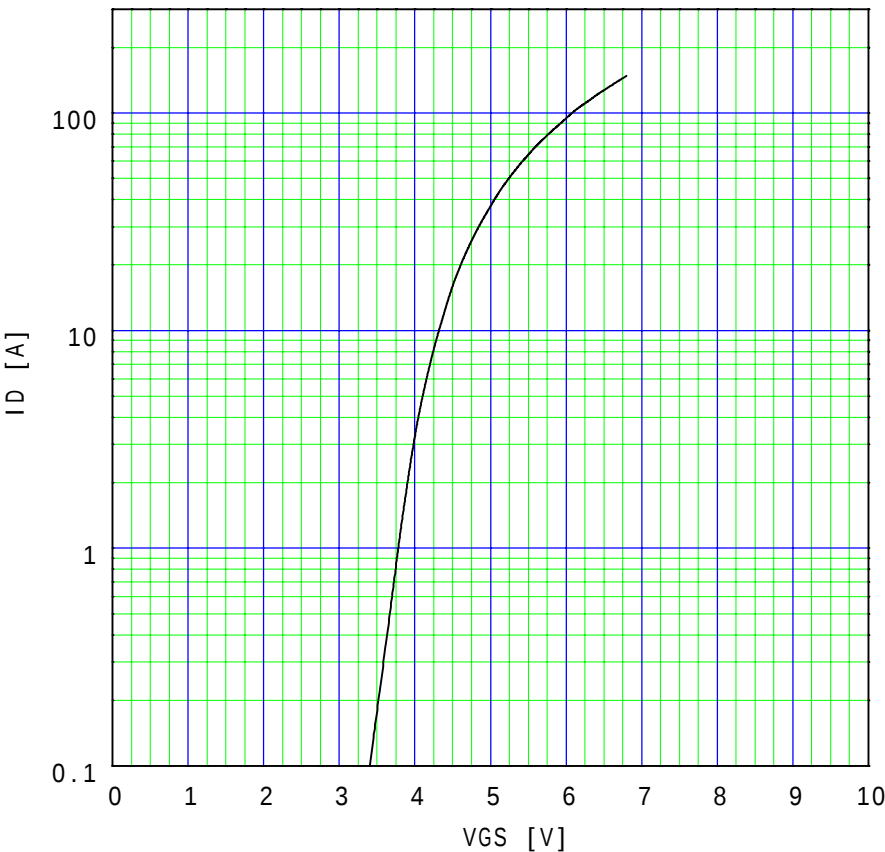
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Typical output characteristics
 $I_D = f(V_{DS})$: 80 μ s pulse test, $T_c = 25$

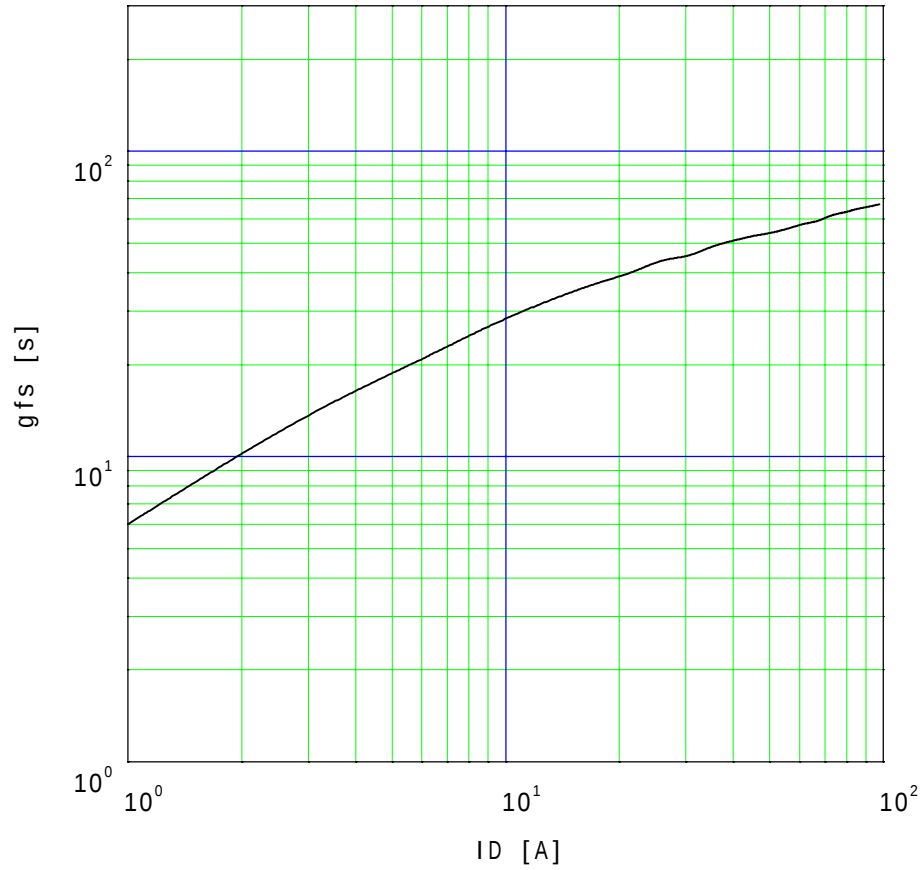


Typical transfer characteristics
 $I_D = f(V_{GS})$: 80 μ s pulse test, $V_{DS} = 10$ V, $T_{ch} = 25$

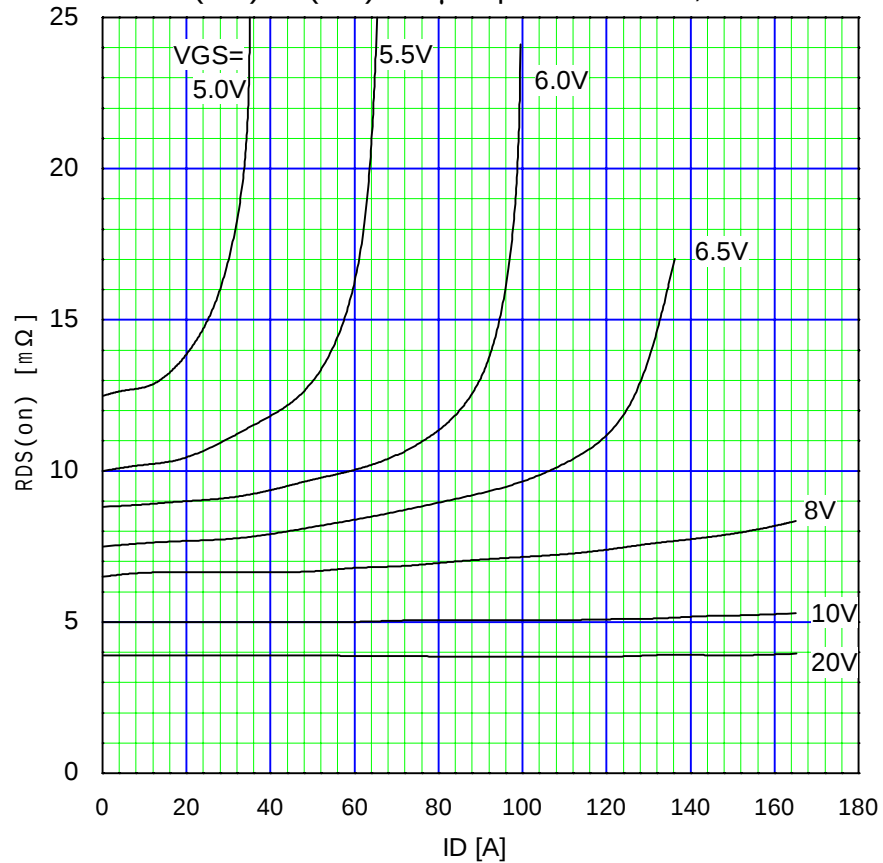


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Typical forward transconductance
 $g_{fs}=f(I_D):80\mu s$ pulse test, $V_{DS}=10V$, $T_{ch}=25$



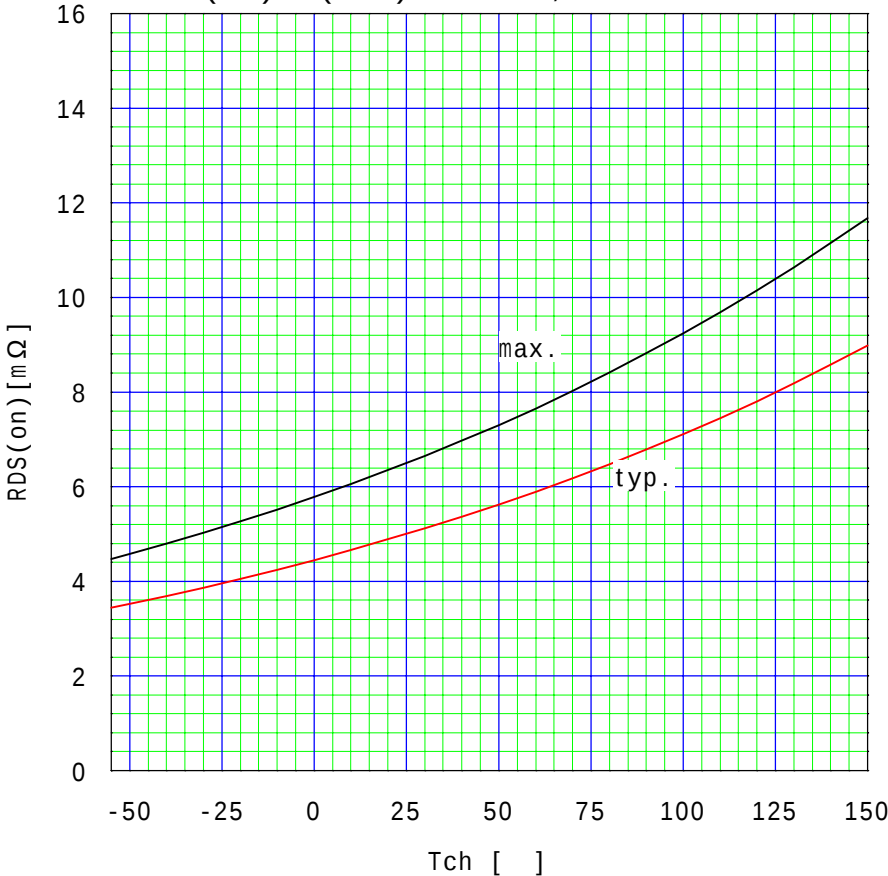
Typical Drain-Source on-State Resistance
 $R_{DS(on)}=f(I_D):80\mu s$ pulse test, $T_{ch}=25$



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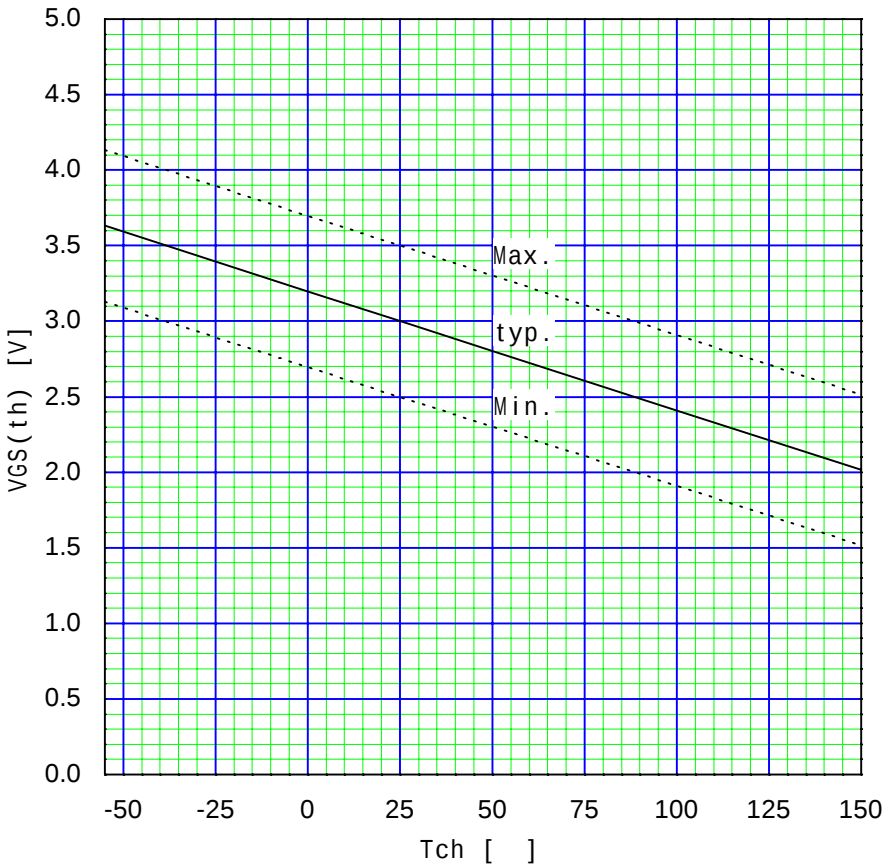
Drain-source on-state resistance

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

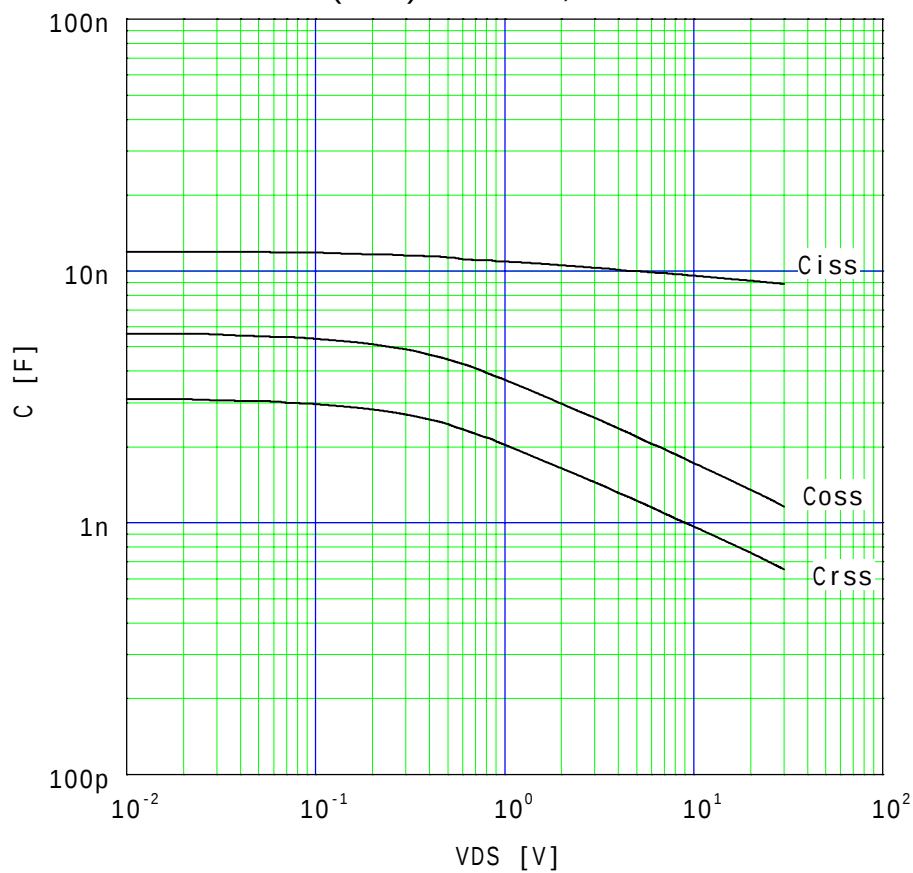


Gate Threshold Voltage vs. T_{ch}

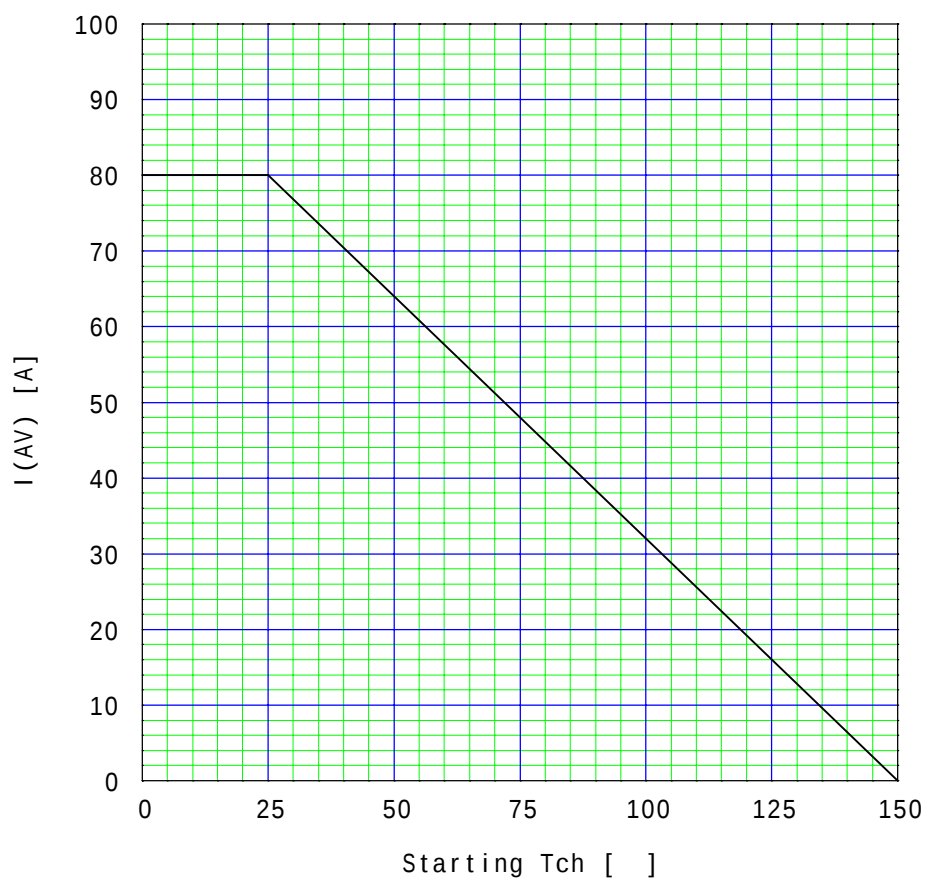
$V_{GS(th)} = f(T_{ch}) : V_{DS} = V_{GS}, I_D = 10mA$



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

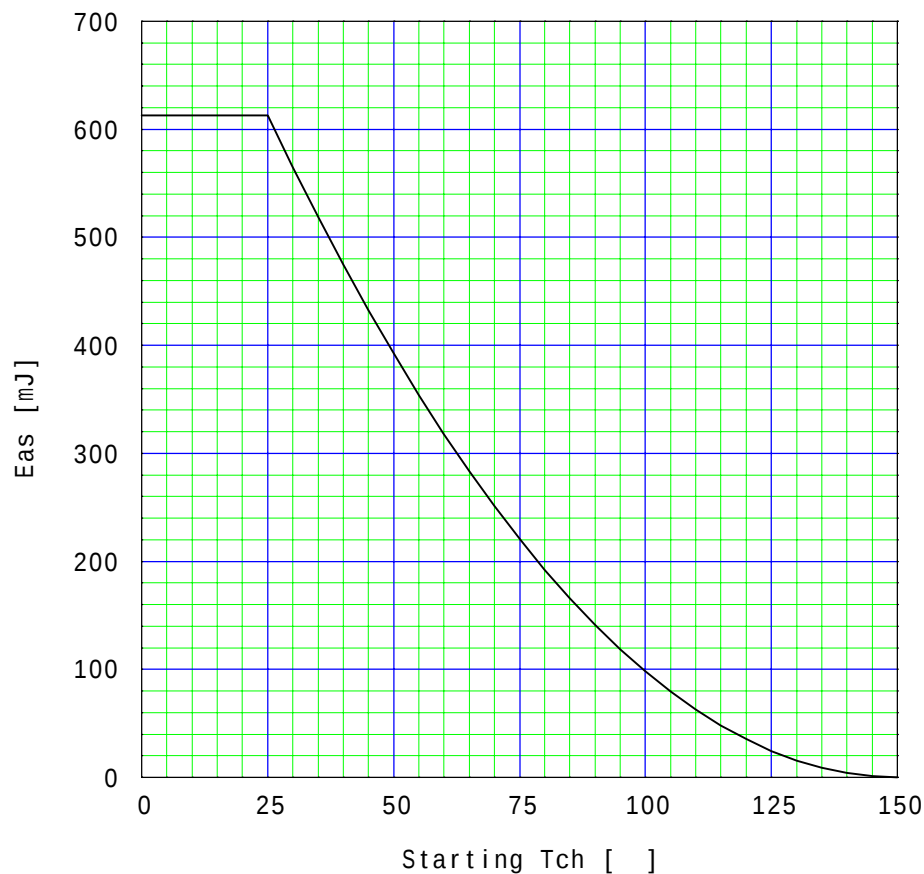


Maximum Avalanche Current vs. starting Tch
 $I(AV)=f(\text{starting Tch})$, single pulse

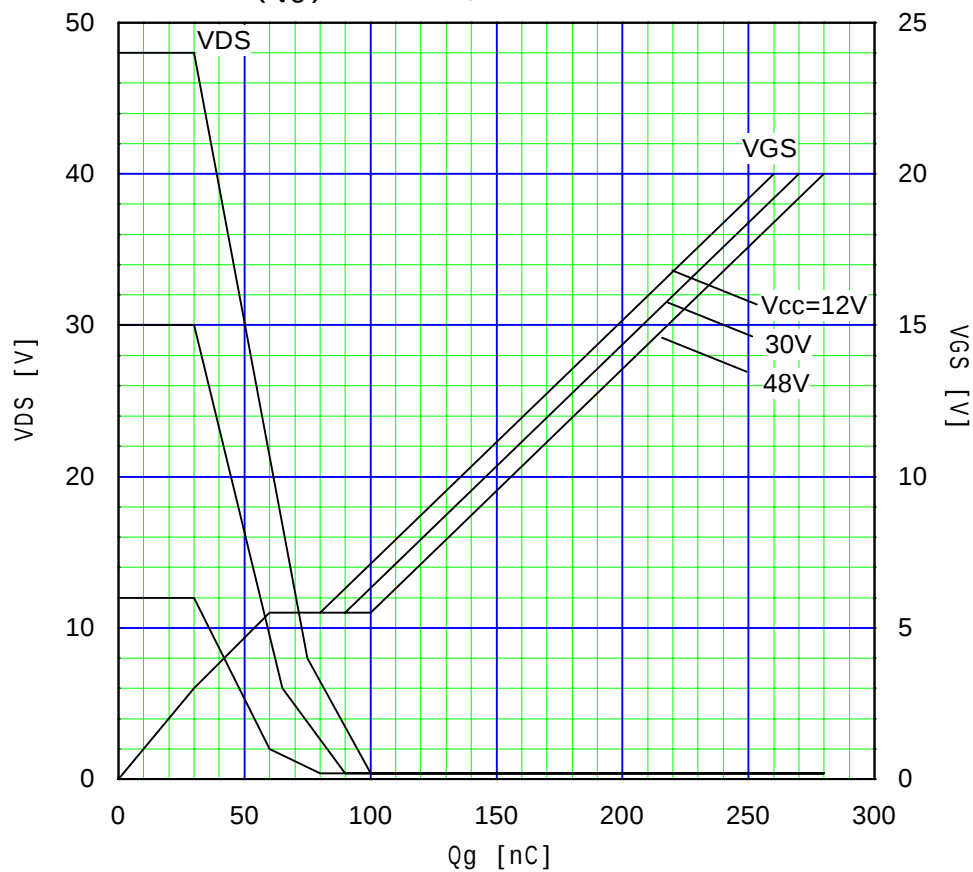


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Maximum Avalanche energy vs. starting Tch
 $E_{as}=f(\text{starting Tch}):V_{cc}=24V, I_{AV} \ 80A$, single pulse

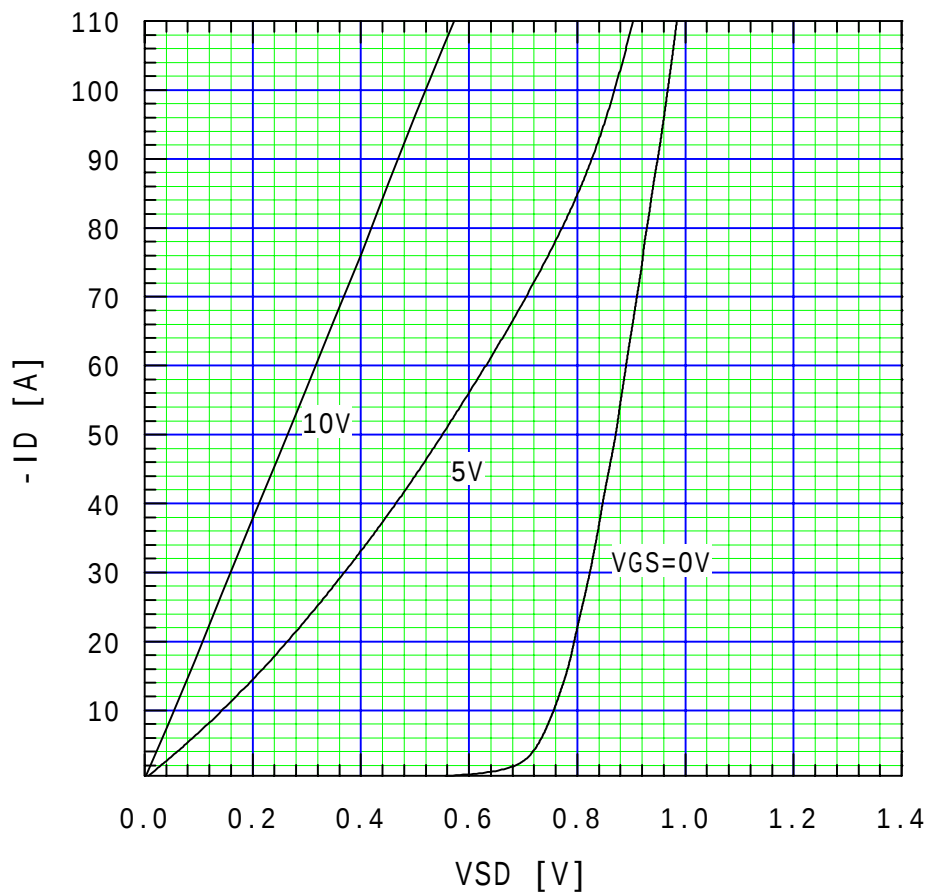


Typical Gate Charge Characteristics
 $V_{GS}=f(Q_g): I_D=80A, Tch=25$

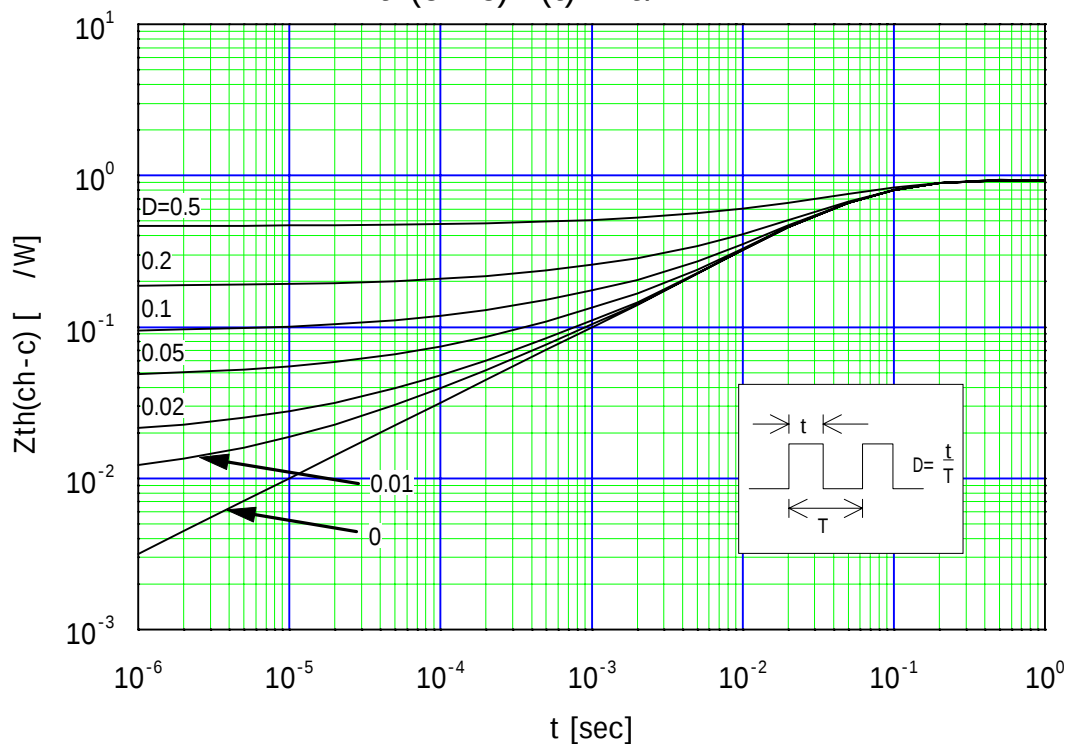


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Typical Forward Characteristics of Reverse Diode
 $-I_D=f(V_{SD}):80\mu s$ pulse test, $T_{ch}=25$

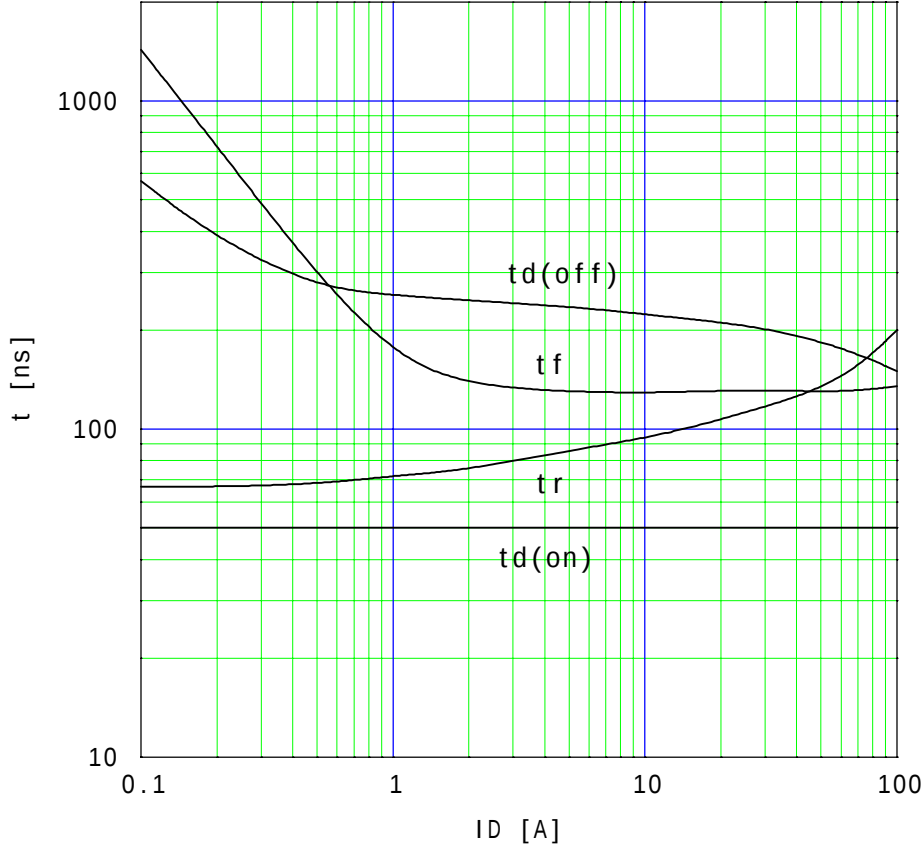


Transient Thermal Impedance
 $Z_{th(ch-c)}=f(t):D=t/T$



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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}
 $BV_{DSX} = f(V_{GS}) : T_{ch} = 25$

