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SPECIFICATION

Device Name : Power MOSFET .

Type Name : 2SK3217-01MR .

Spec. No. : .

Date : 7-Jan. -1999 .

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	DATE	NAME	APPROVED	Fuji Electric Co.,Ltd.		
DRAWN	7-Jan.-'99			DWG NO.	1 • ^ 13	a
CHECKED						b

- 1.Scope** This specifies Fuji Power MOSFET 2SK3217-01MR
- 2.Construction** N-Channel enhancement mode power MOSFET
- 3.Applications** for Switching
- 4.Outview** TO-220F

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

Description	Symbol	Characteristics	Unit	Remarks
Drain-Source Voltage	V_{DS}	100	V	
Continuous Drain Current	I_D	± 50	A	
Pulsed Drain Current	I_{DP}	± 200	A	
Gate-Source Voltage	V_{GS}	± 30	V	
Maximum Avalanche Energy	E_{AV}	464	mJ	*1
Maximum Power Dissipation	P_D	70	W	
	P_D	2.0	W	Ta=25°C
Operating and Storage	T_{ch}	150	°C	
Temperature range	T_{stg}	-55 to +150	°C	

*1 L=298 μ H, 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}	$I_D=1mA$ $V_{GS}=0V$	100			V
Gate Threshold Voltage	$V_{GS(th)}$	$I_D=1mA$ $V_{DS}=V_{GS}$	2.5	3.0	3.5	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100V$ $T_{ch}=25^\circ C$		1	100	μA
		$V_{GS}=0V$ $T_{ch}=125^\circ C$		0.1	0.5	mA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V$ $V_{DS}=0V$		10	100	nA
Drain-Source On-State Resistance	$R_{DS(on)}$	$ID=25A$ $VGS=10V$		20	25	m Ω

Dynamic Ratings

Description	Symbol	Conditions	min.	typ.	max.	Unit
Forward Transconductance	g_{fs}	$I_D=25.0A$ $V_{DS}=25V$	16.0	32.0		S
Input Capacitance	C_{iss}	$V_{DS}=25V$ $V_{GS}=0V$ $f=1MHz$		3200	4800	pF
Output Capacitance	C_{oss}			760	1140	
Reverse Transfer Capacitance	C_{rss}			230	345	
Turn-On Time	$t_d(on)$	$V_{cc}=48V$ $V_{GS}=10V$ $I_D=50A$ $R_{GS}=10\Omega$		23	35	ns
	t_r			130	195	
Turn-Off Time	$t_d(off)$			110	165	
	t_f			65	100	

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	50			A
Diode Forward On-Voltage	V_{SD}	$I_F=50A$ $V_{GS}=0V$ $T_{ch}=25^\circ C$		0.97	1.46	V
Reverse Recovery Time	t_{rr}	$I_F=50A$ $V_{GS}=0V$ $-di/dt=100A/\mu s$ $T_{ch}=25^\circ C$		150		ns
Reverse Recovery Charge	Q_{rr}			0.80		μC

7.Thermal Resistance

Description	Symbol	min.	typ.	max.	Unit
Channel to Case	$R_{th}(ch-c)$			1.79	$^\circ C/W$
Channel to Ambient	$R_{th}(ch-a)$			62.5	$^\circ C/W$

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Fig.1 Test circuit

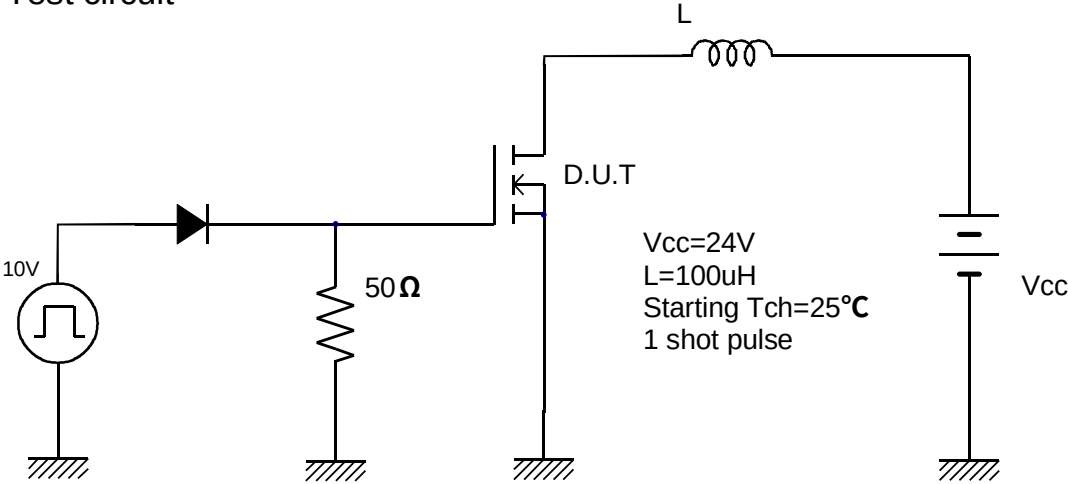
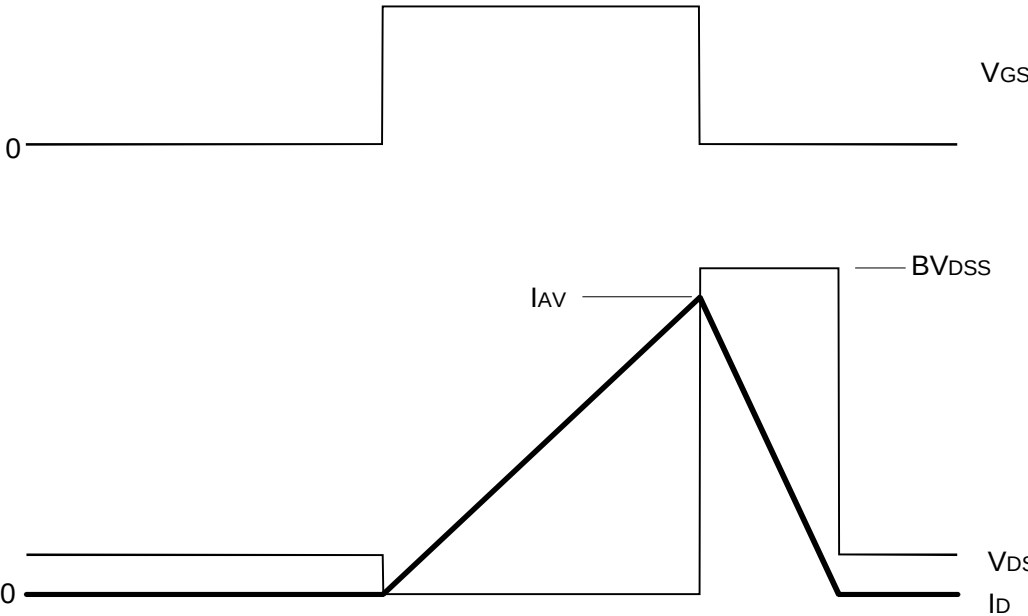
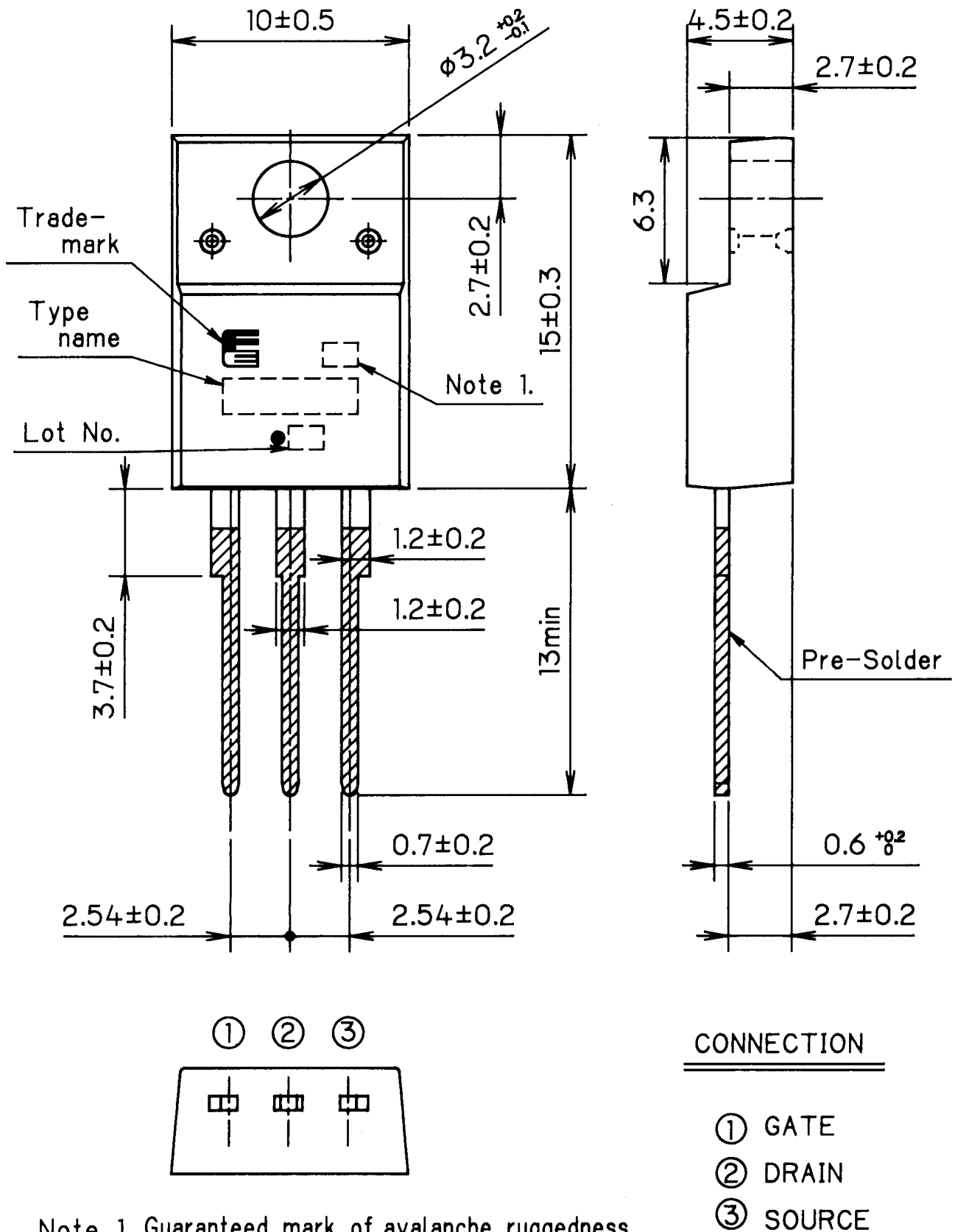
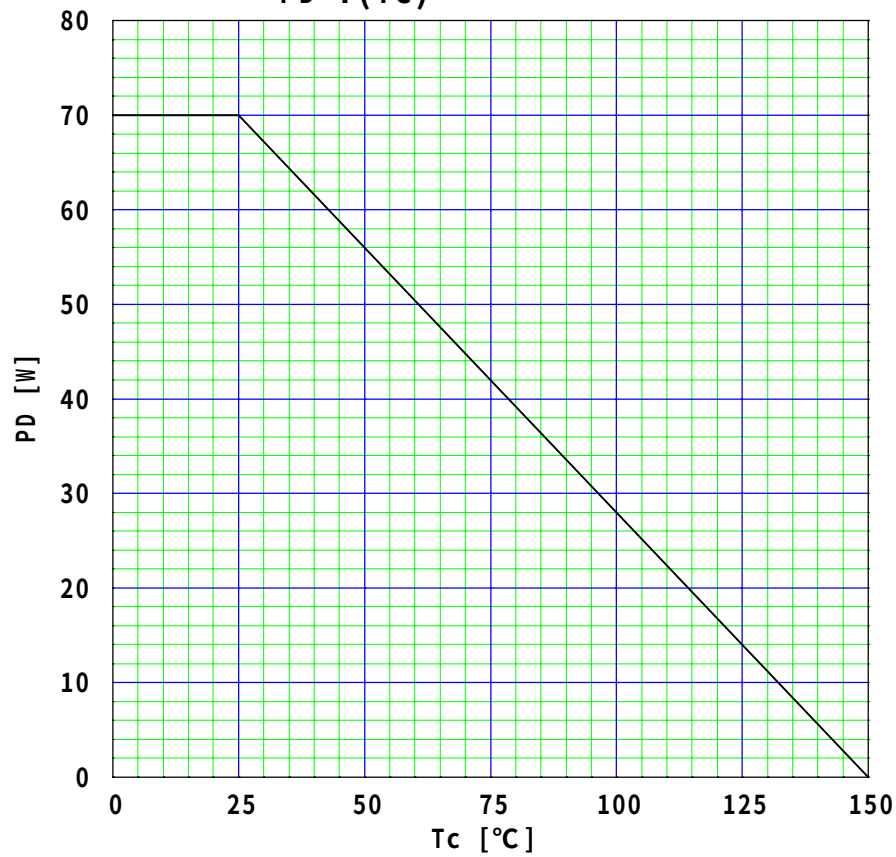


Fig.2 Operating waveforms

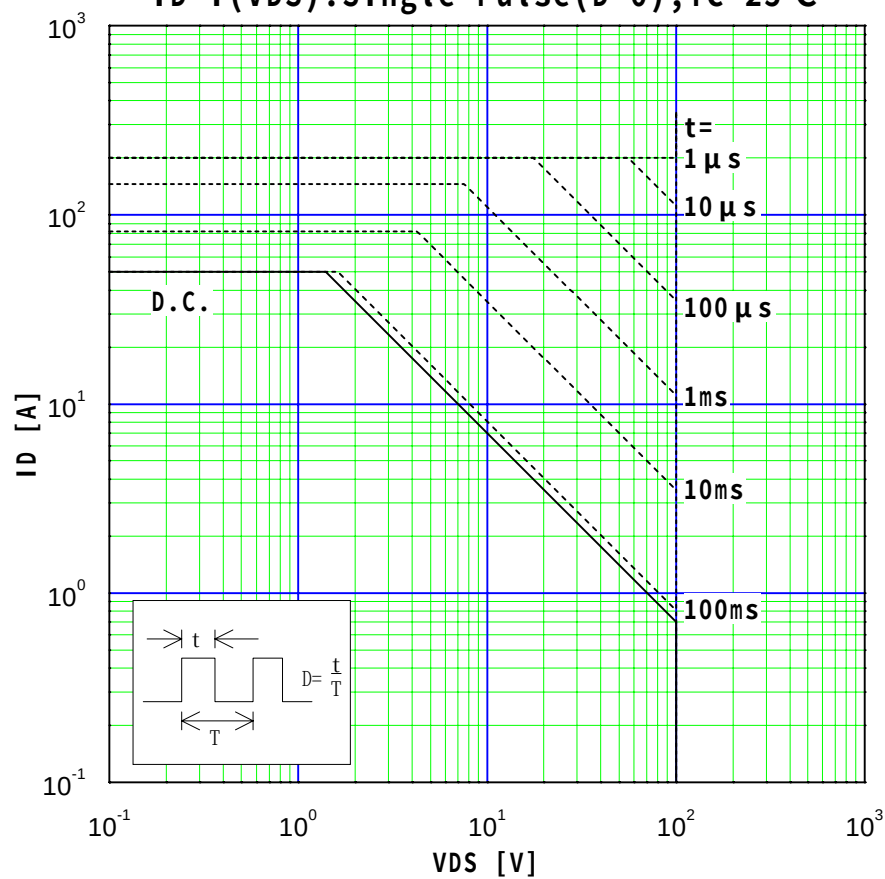




Power Dissipation $PD=f(T_c)$



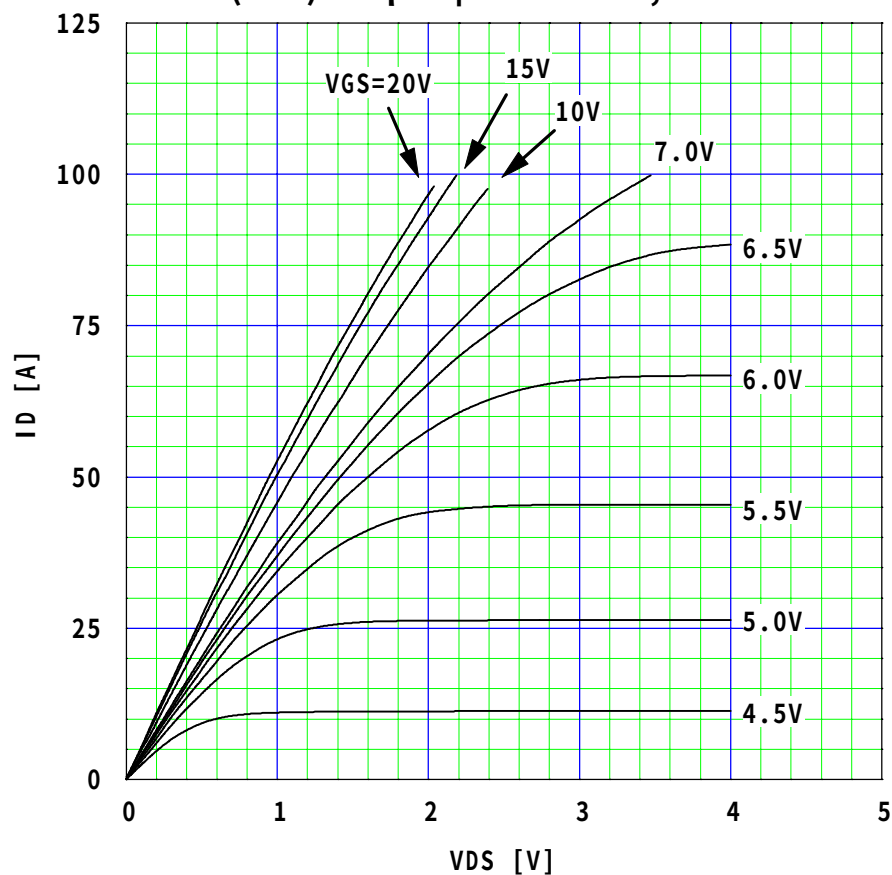
Safe operating area $ID=f(V_{DS})$: Single Pulse ($D=0$), $T_c=25^\circ\text{C}$



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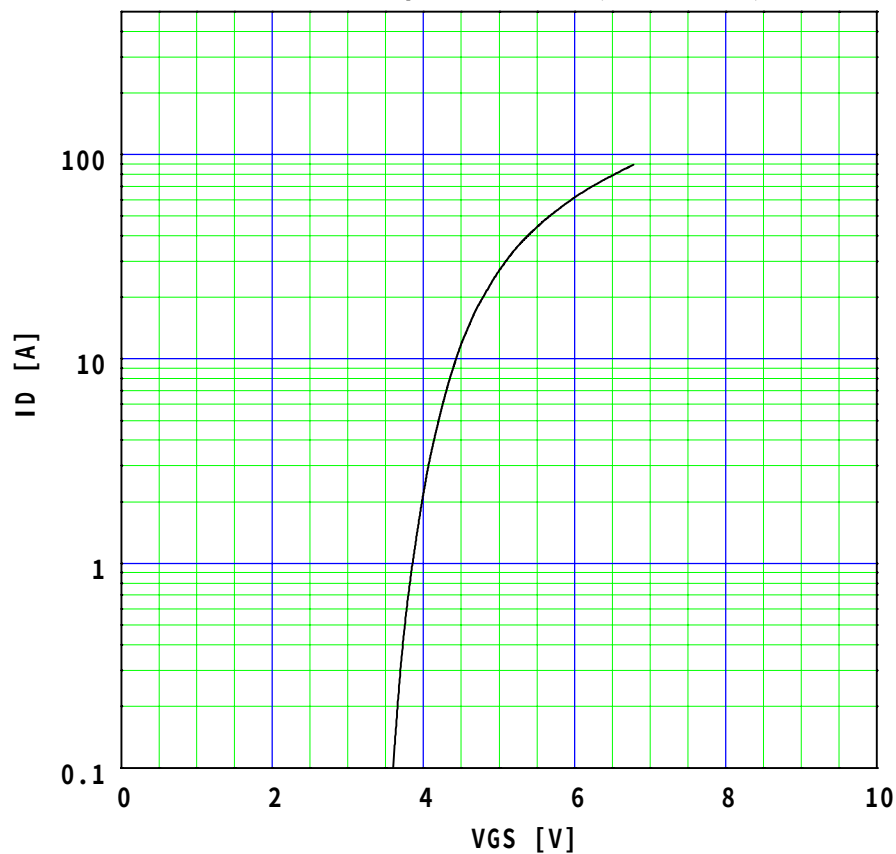
Typical output characteristics

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



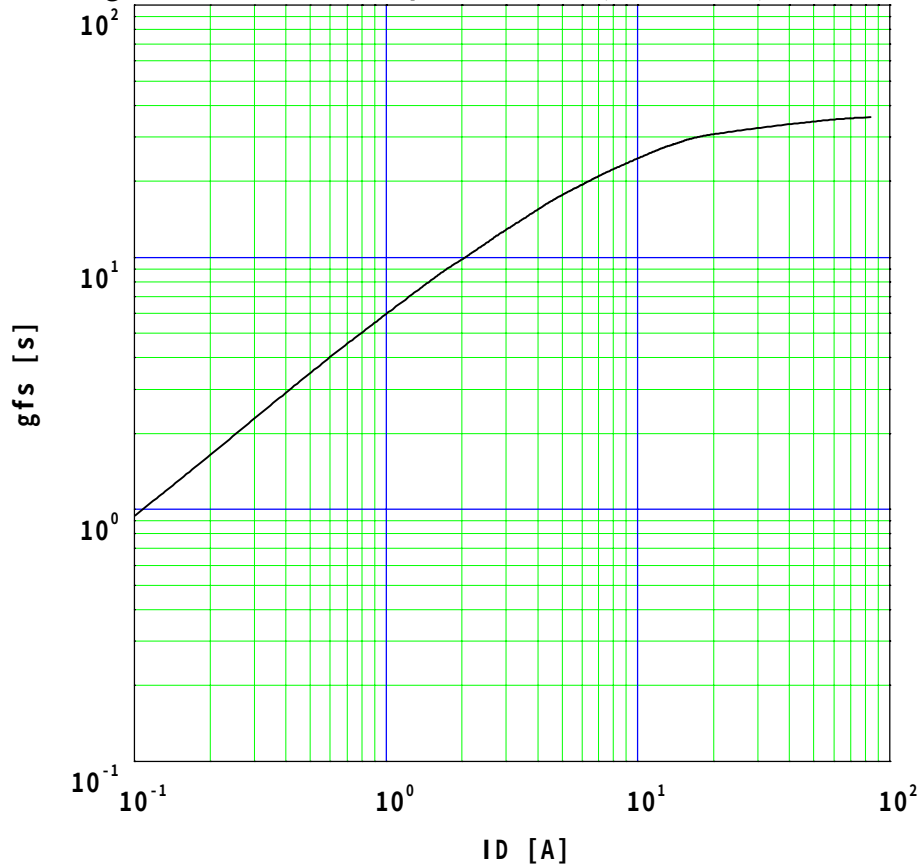
Typical transfer characteristics

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

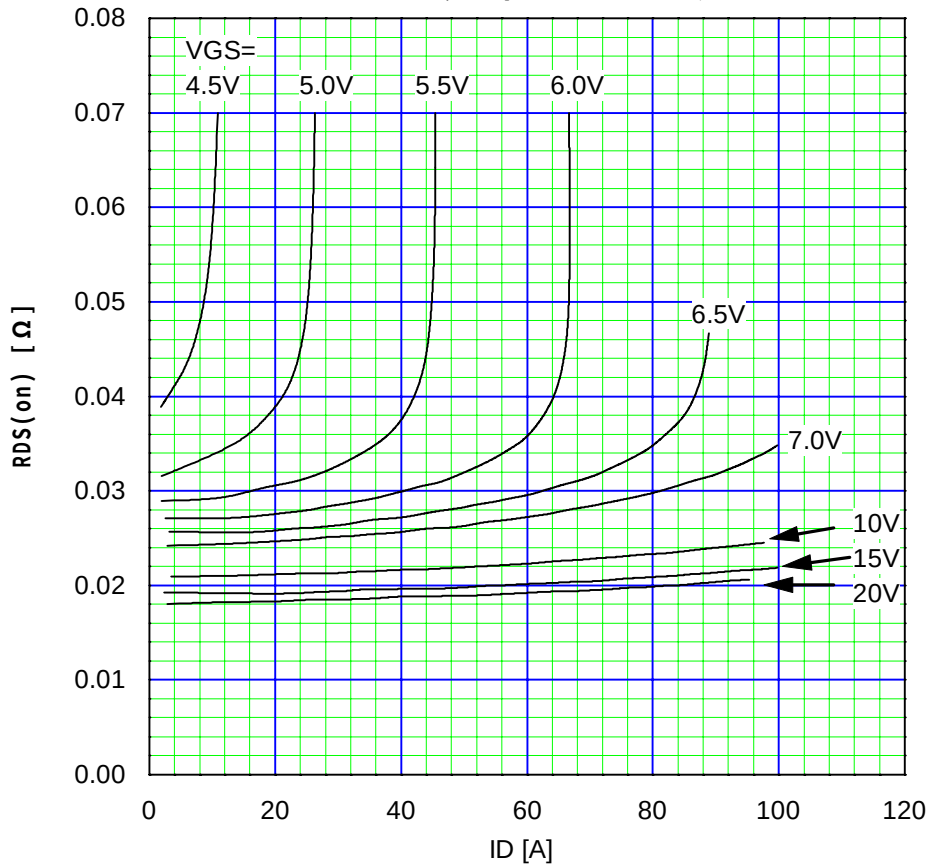


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Typical forward transconductance
 $g_{fs}=f(I_D):80\mu s$ pulse test, $V_{DS}=25V$, $T_{ch}=25^\circ C$

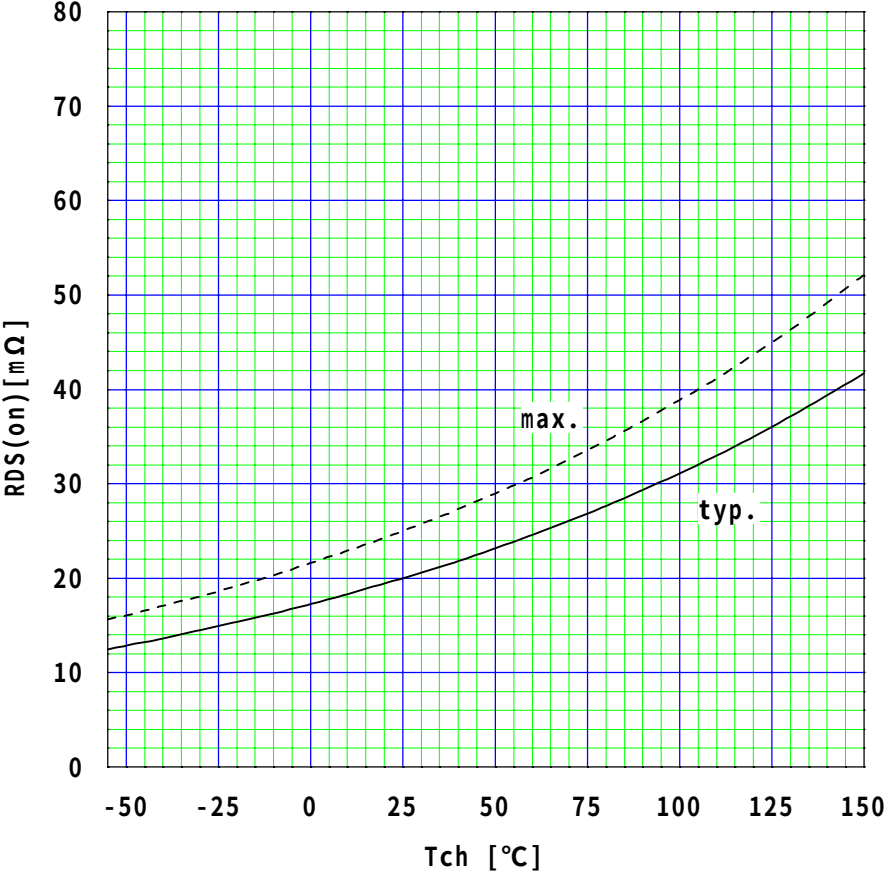


Typical Drain-Source on-State Resistance
 $R_{DS(on)}=f(I_D):80\mu s$ pulse test, $T_{ch}=25^\circ C$

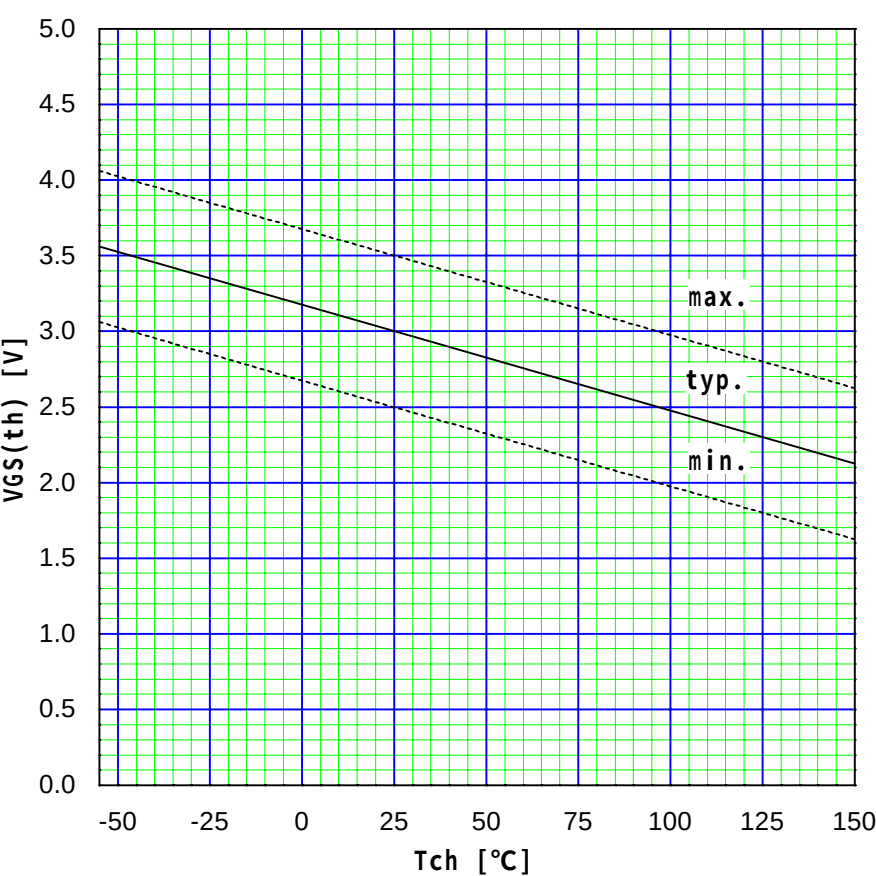


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Drain-source on-state resistance
 $R_{DS(on)} = f(T_{ch}) : I_D = 25A, V_{GS} = 10V$

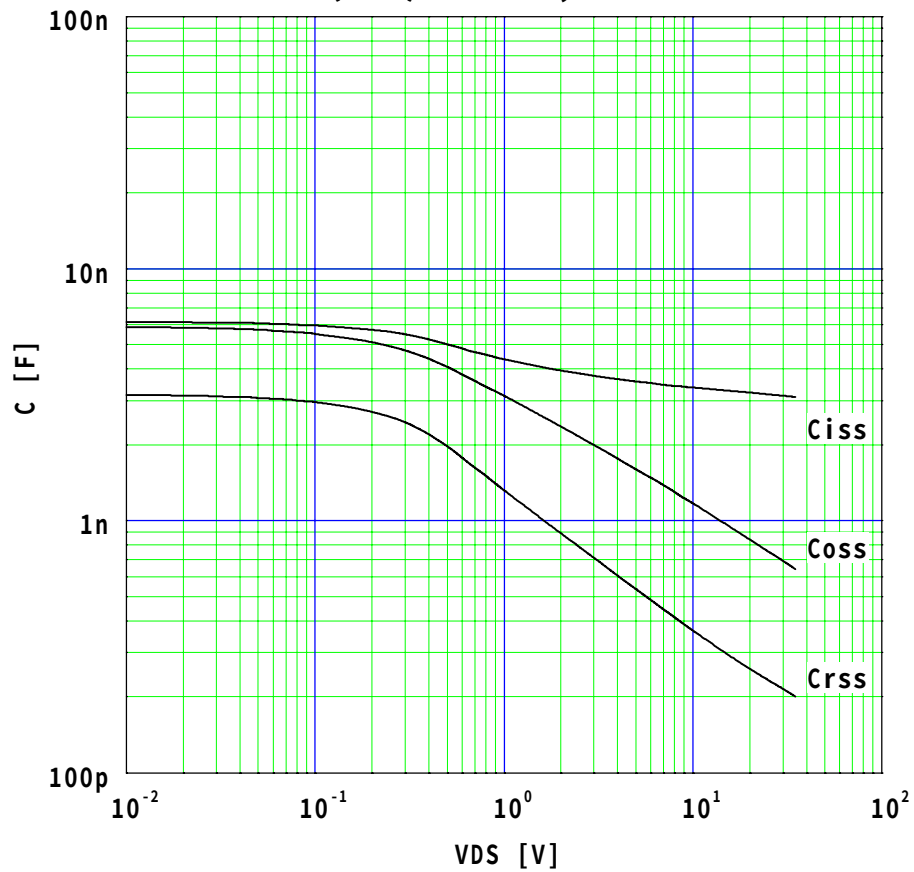


Gate Threshold Voltage vs. T_{ch}
 $V_{GS(th)} = f(T_{ch}) : V_{DS} = V_{GS}, I_D = 1mA$



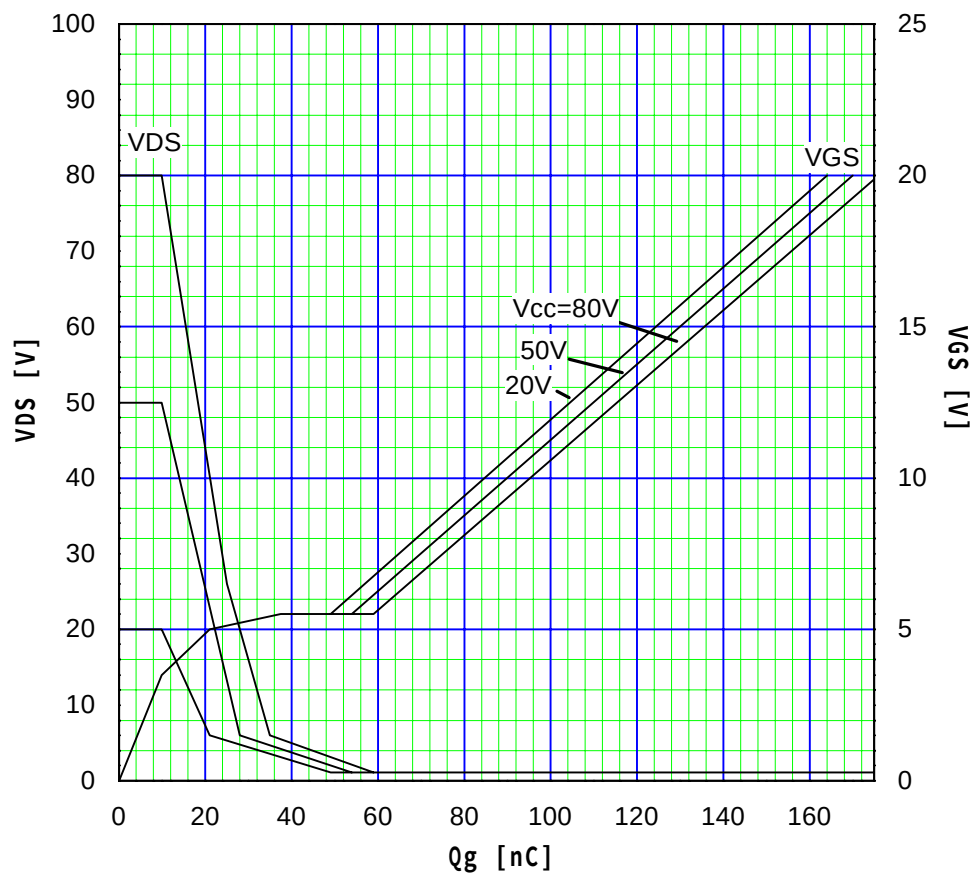
Typical capacitances

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

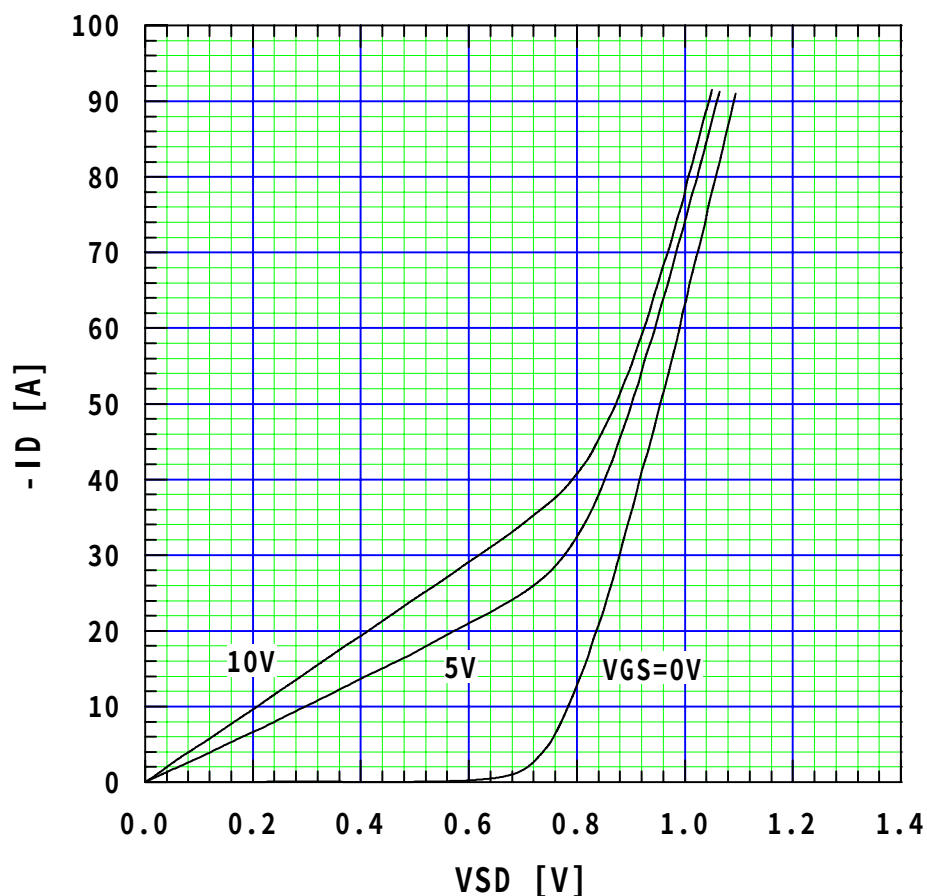


Typical Gate Charge Characteristics

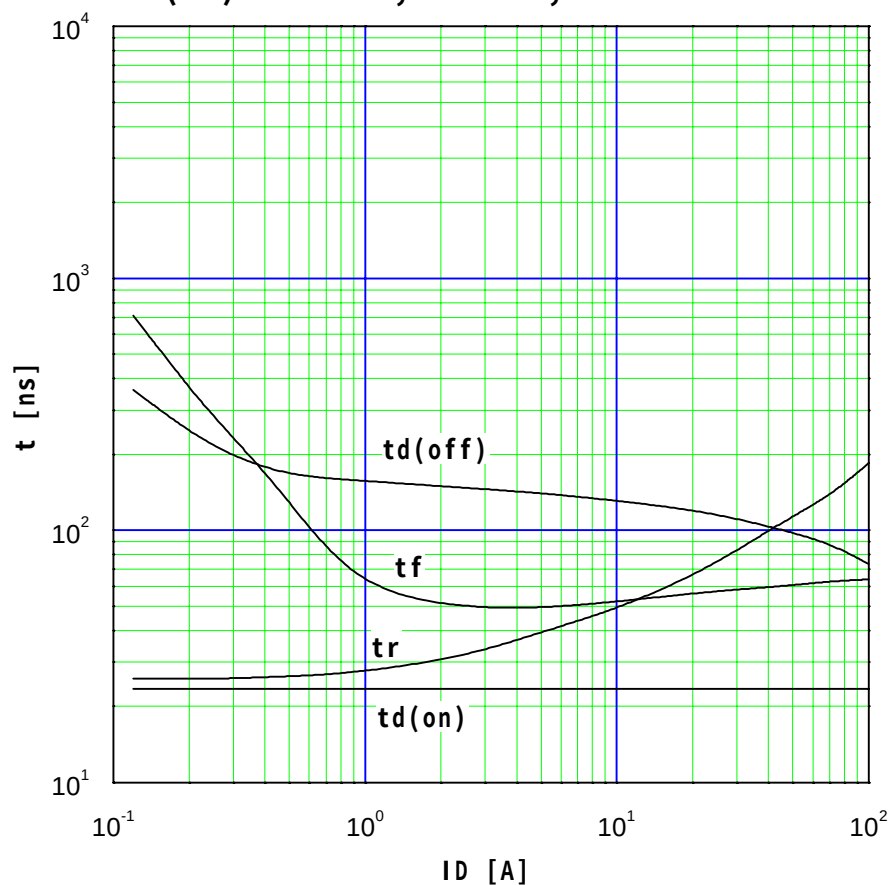
$V_{GS}=f(Q_g):I_D=50A, T_{ch}=25^{\circ}C$



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

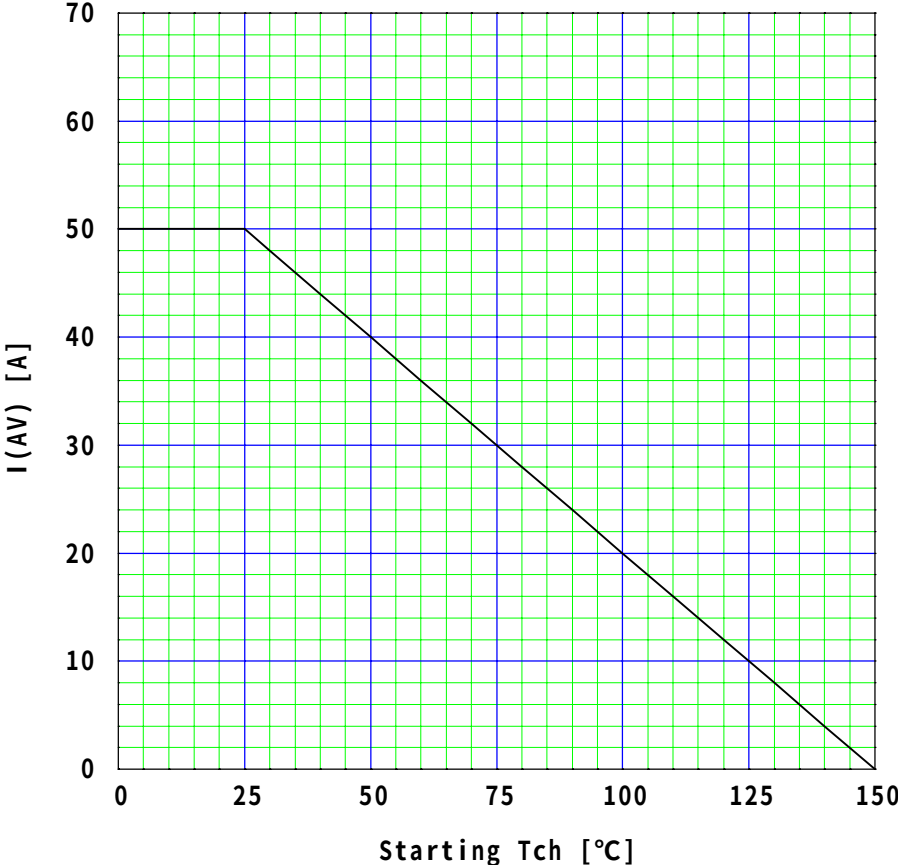


Typical Switching Characteristics vs. I_D $t=f(I_D):V_{cc}=48V, V_{GS}=10V, R_G=10\Omega$

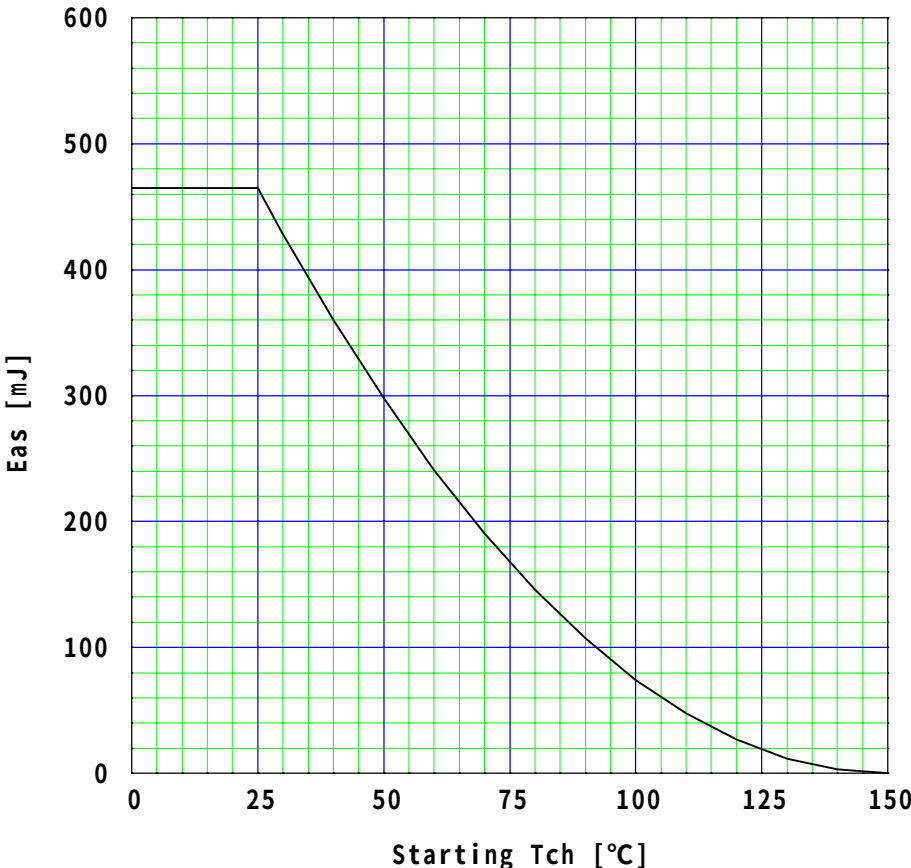


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Maximum Avalanche Current vs. starting Tch
 $I(AV)=f(\text{starting Tch}), \text{Non Repetitive}$



Maximum Avalanche energy vs. starting Tch
 $Eas=f(\text{starting Tch}):V_{cc}=24V, I_{AV} \leq 50A, \text{Non-Repetitive}$



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

