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# SPECIFICATION

Device Name : Power MOSFET

Type Name : 2SK3362-01

Spec. No. :

Fuji Electric Co.,Ltd.  
Matsumoto Factory

	DATE	NAME	APPROVED		Fuji Electric Co.,Ltd.	
DRAWN	Feb.-4-'99				DWG.NO.	1/13
CHECKED						

- 1.Scope** This specifies Fuji Power MOSFET 2SK3362-01
- 2.Construction** N-Channel enhancement mode power MOSFET
- 3.Applications** for Switching
- 4.Outview** TO-220 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	$V_{DS}$	60	V	
Continuous Drain Current	$I_D$	$\pm 50$	A	
Pulsed Drain Current	$I_{DP}$	$\pm 200$	A	
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V	
Maximum Avalanche Energy	$E_{AV}$	867	mJ	*1
Maximum Power Dissipation	$P_D$	80	W	
Operating and Storage	$T_{ch}$	150	°C	
Temperature range	$T_{stg}$	-55 to +150	°C	

\*1 L=0.463mH, 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
Gate Threshold Voltage	$V_{GS(th)}$	$I_D=1mA$ $V_{DS}=V_{GS}$	1.0	1.5	2.0	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=60V$ $V_{GS}=0V$ $T_{ch}=25^\circ C$		10	500	$\mu A$
		$T_{ch}=125^\circ C$		0.2	1.0	mA
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V$ $V_{DS}=0V$		10	100	nA
Drain-Source On-State Resistance	$R_{DS(on)}$	$ID=40A$ $V_{GS}=4V$		12	17	m $\Omega$
		$V_{GS}=10V$		7.5	10	

## Dynamic Ratings

Description	Symbol	Conditions	min.	typ.	max.	Unit
Forward Transconductance	$g_{fs}$	$I_D=40A$ $V_{DS}=25V$	25.0	55.0		S
Input Capacitance	$C_{iss}$	$V_{DS}=25V$ $V_{GS}=0V$ $f=1MHz$		3500	5250	pF
Output Capacitance	$C_{oss}$			1250	1870	
Reverse Transfer Capacitance	$C_{rss}$			360	540	
Turn-On Time	$t_{d(on)}$	$V_{cc}=30V$		15	23	ns
	$t_r$	$V_{GS}=10V$		75	120	
Turn-Off Time	$t_{d(off)}$	$I_D=75A$		190	285	
	$t_f$	$R_{GS}=10\Omega$		110	165	

## 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	$V_{SD}$	$I_F=160A$ $V_{GS}=0V$ $T_{ch}=25^\circ C$		1.15	1.65	V
Reverse Recovery Time	$t_{rr}$	$I_F=80A$ $V_{GS}=0V$		75	120	ns
Reverse Recovery Charge	$Q_{rr}$	$-di/dt=100A/\mu s$ $T_{ch}=25^\circ C$		0.17		$\mu C$

## 7.Thermal Resistance

Description	Symbol	min.	typ.	max.	Unit
Channel to Case	$R_{th(ch-c)}$			1.56	$^\circ C/W$
Channel to Ambient	$R_{th(ch-a)}$			75.0	$^\circ C/W$

Fig.1 Test circuit

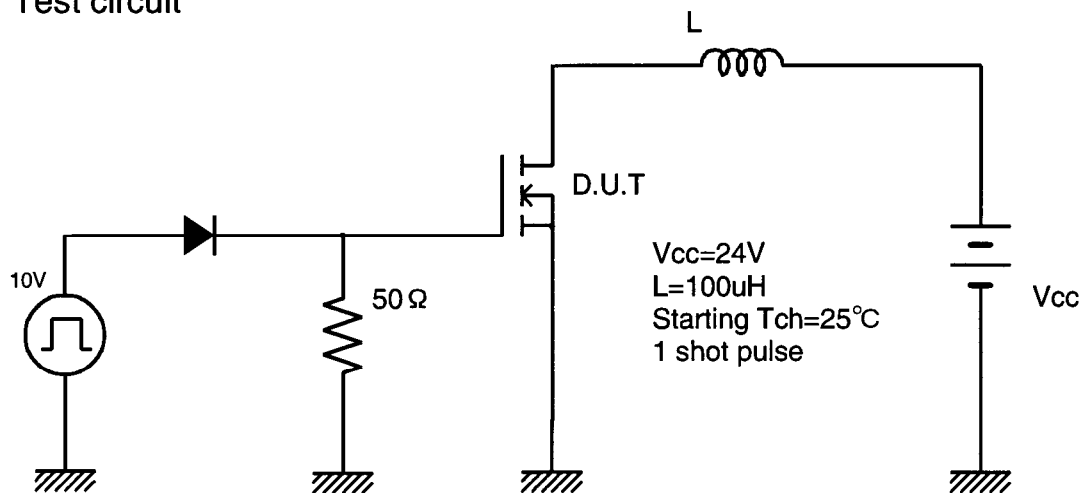
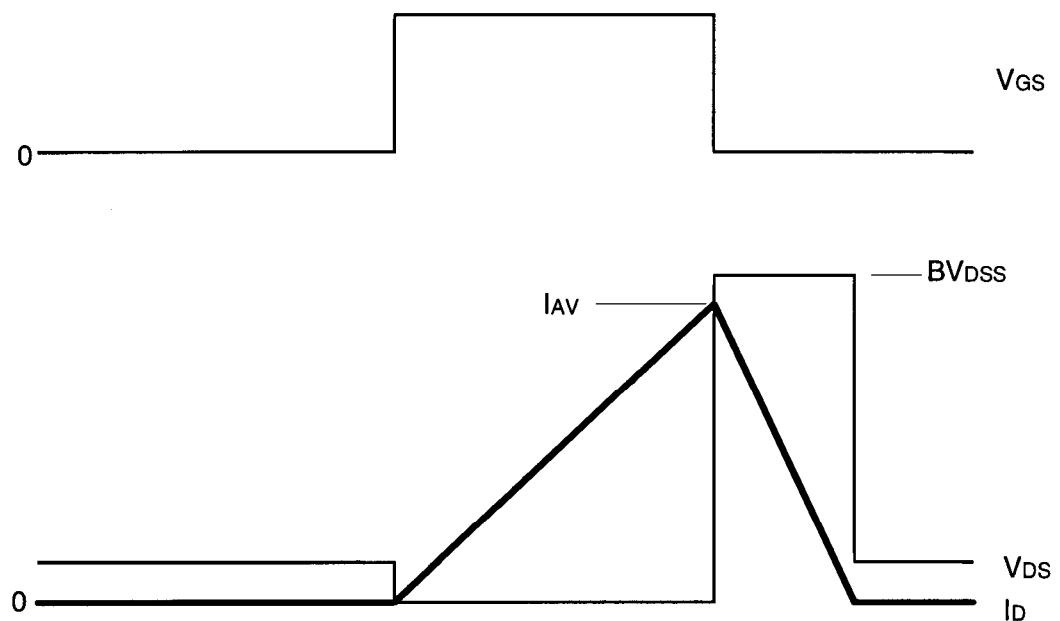
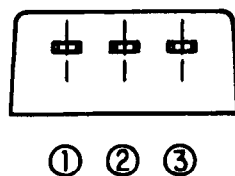
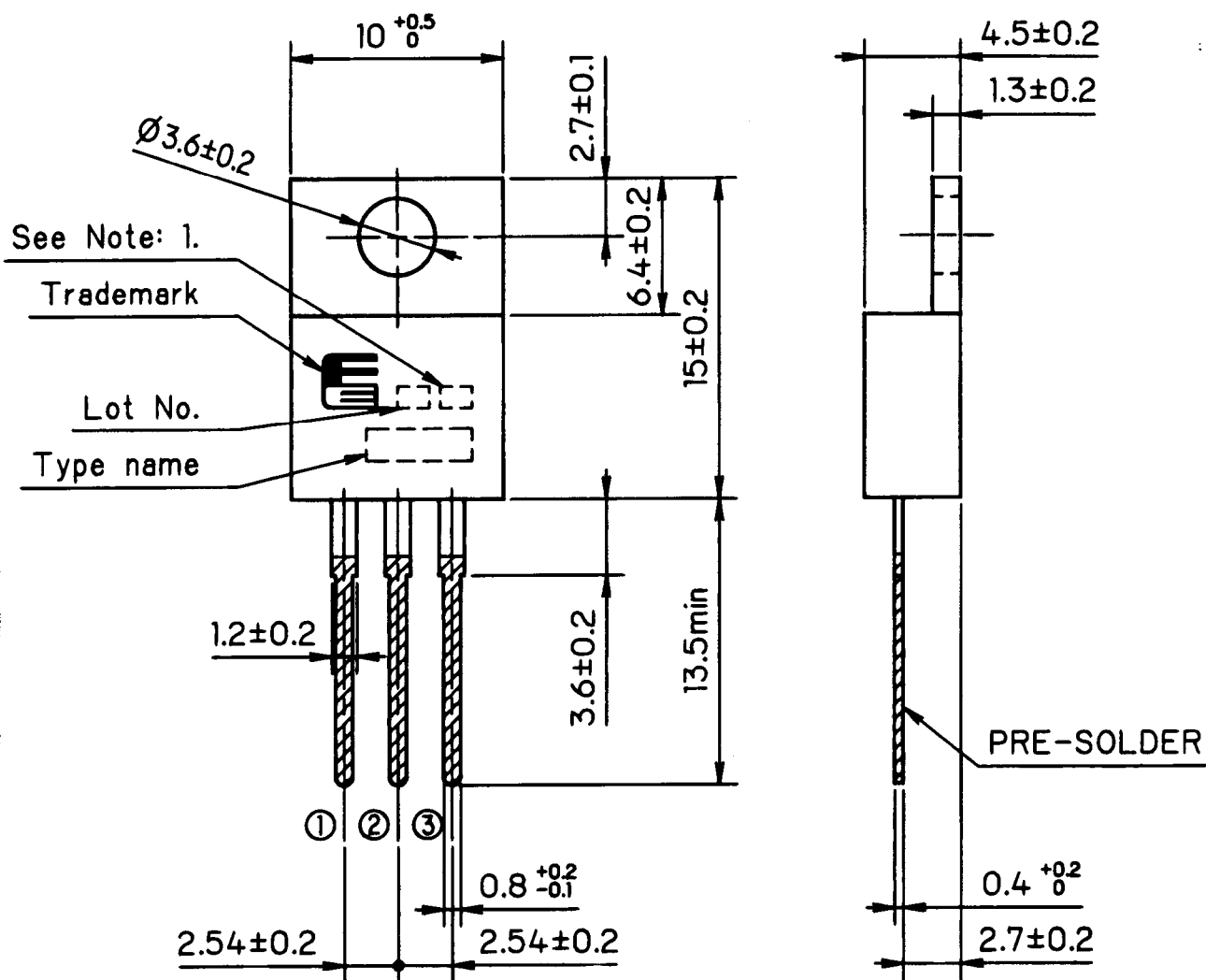


Fig.2 Operating waveforms





### CONNECTION

- ① GATE
- ② DRAIN
- ③ SOURCE

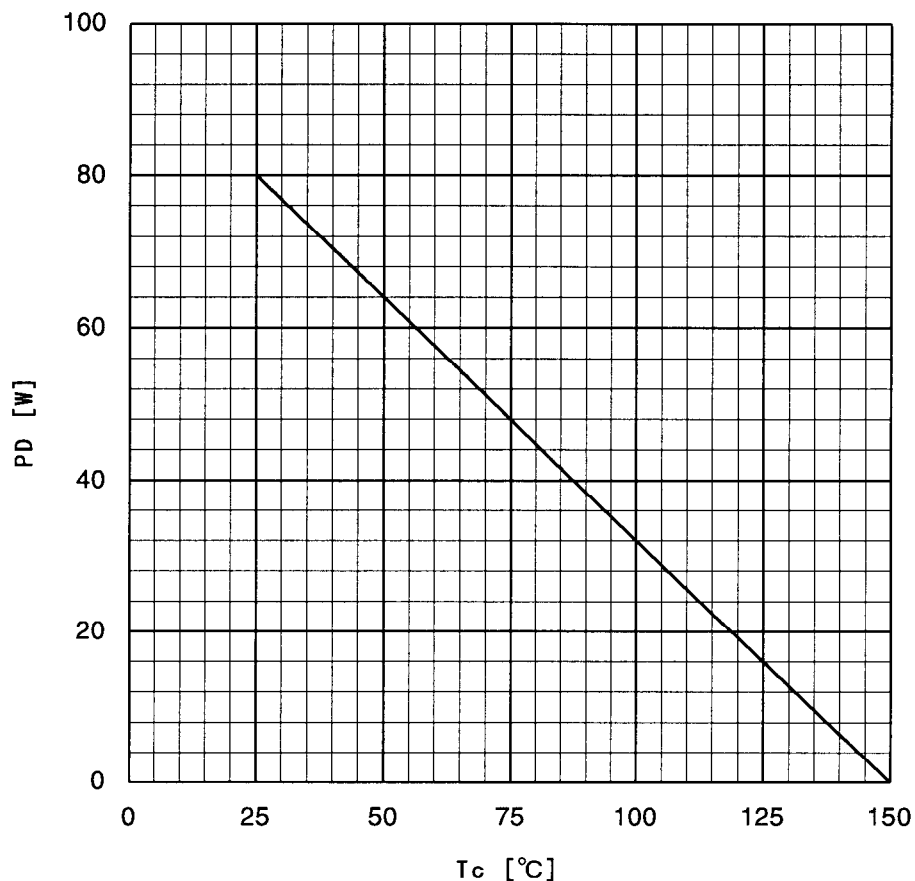
JEDEC : TO-220AB

Note: 1. Guaranteed mark of avalanche ruggedness.

DIMENSIONS ARE IN MILLIMETERS.

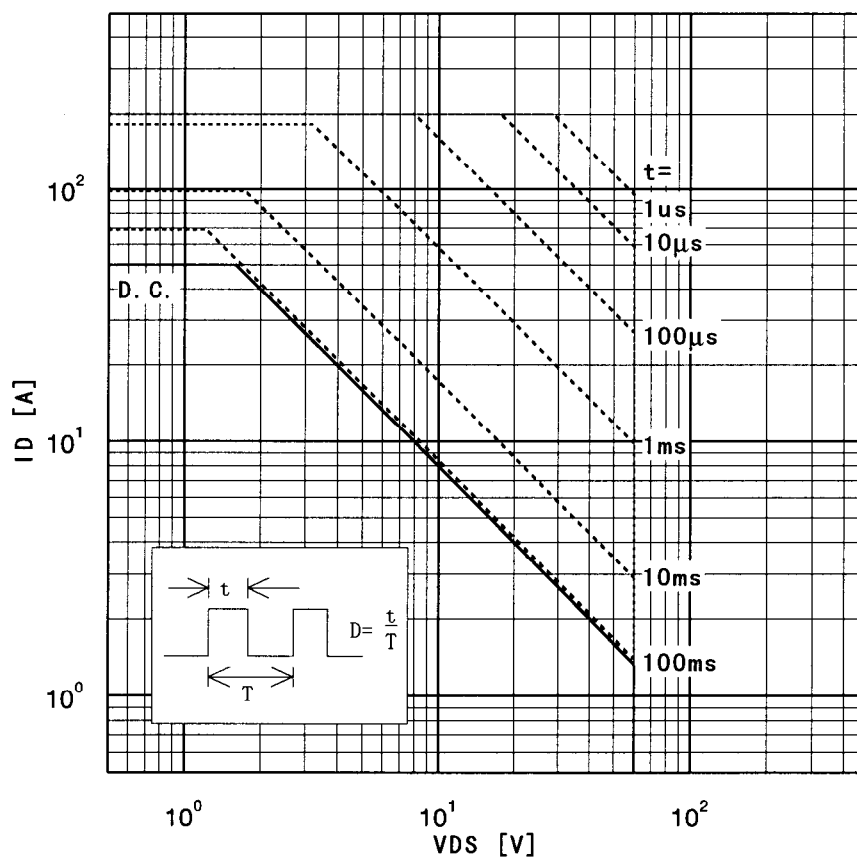
# Power Dissipation

$$PD=f(T_c)$$



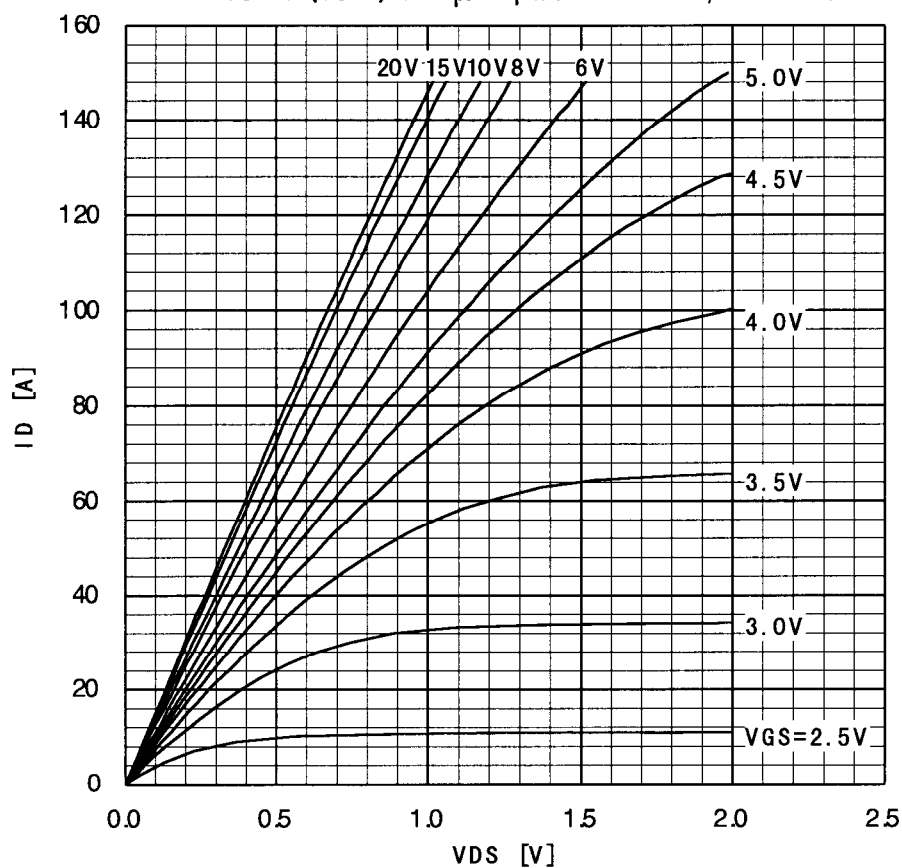
## Safe operating area

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



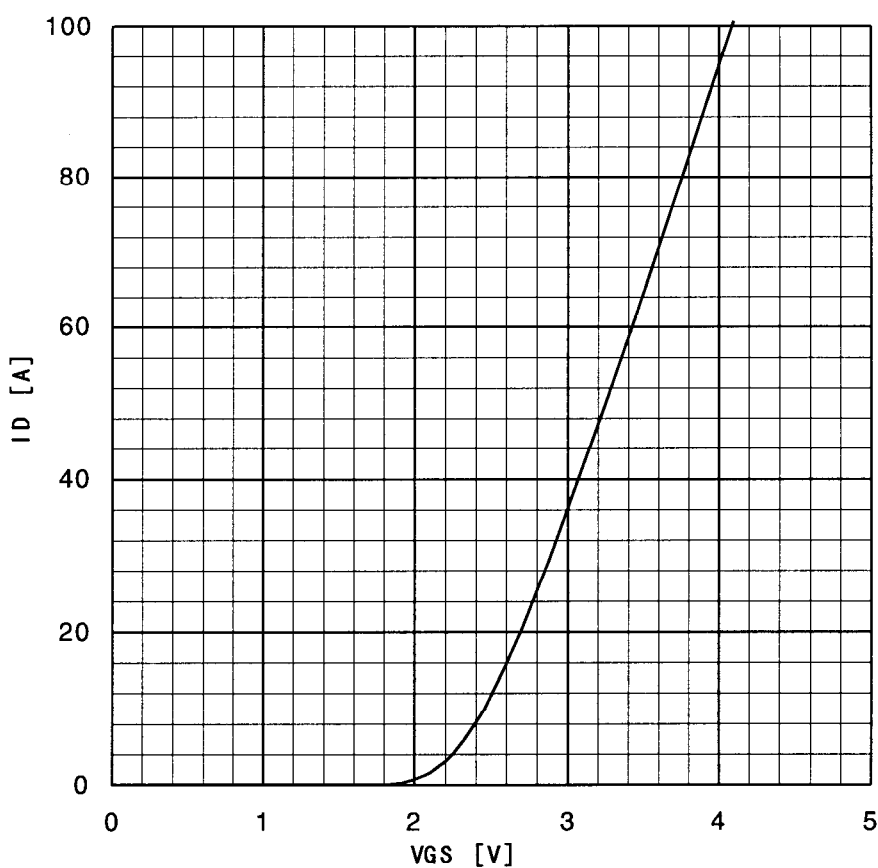
# Typical Output Characteristics

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



# Typical Transfer Characteristic

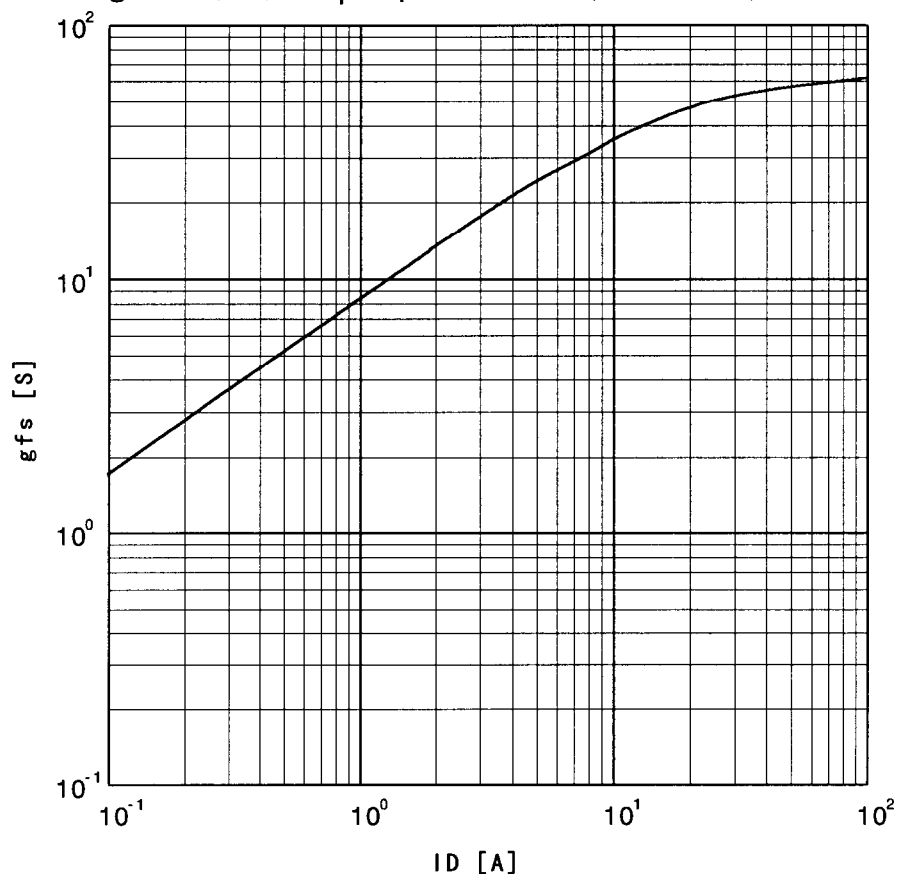
$I_D = f(V_{GS})$  : 80 $\mu$ s pulse test,  $V_{DS} = 25\text{V}$ ,  $T_{ch} = 25^\circ\text{C}$



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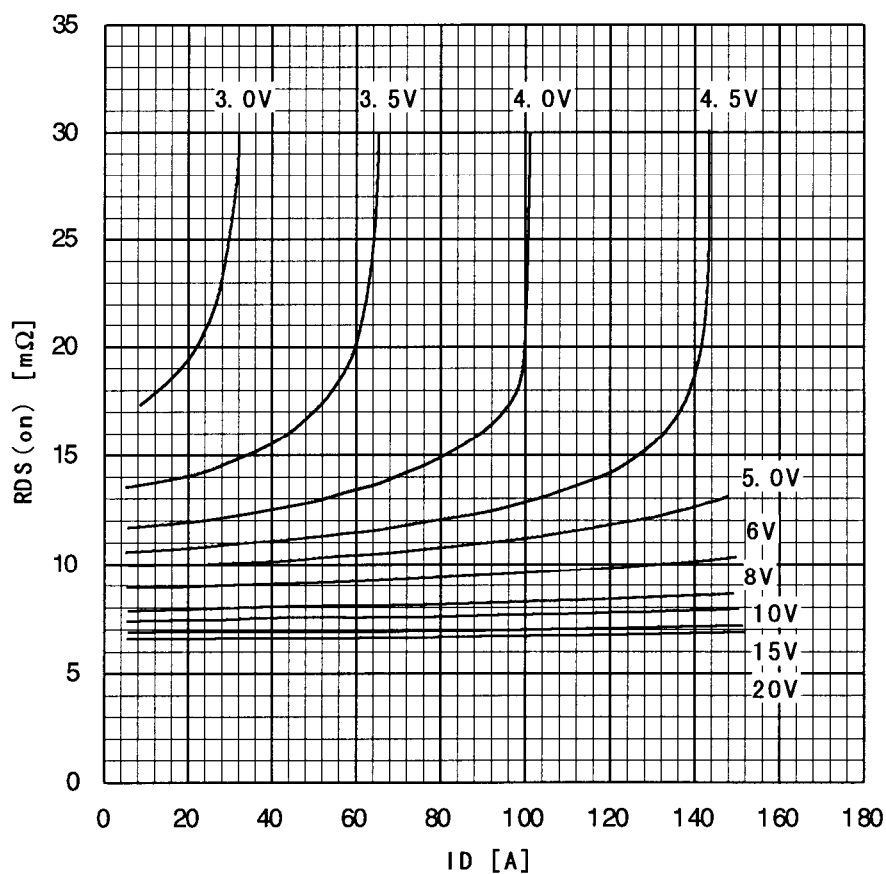
### Typical Transconductance

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



### Typical Drain-Source on-State Resistance

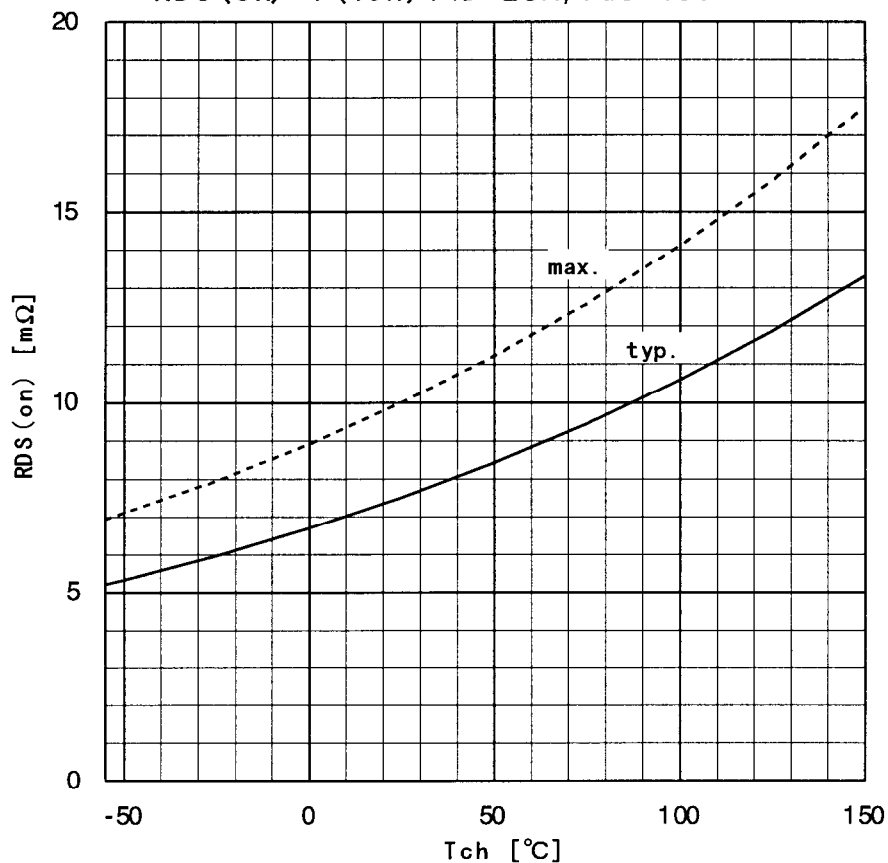
$R_{DS(on)}=f(I_D):80\mu s$  pulse test,  $T_{ch}=25^\circ C$





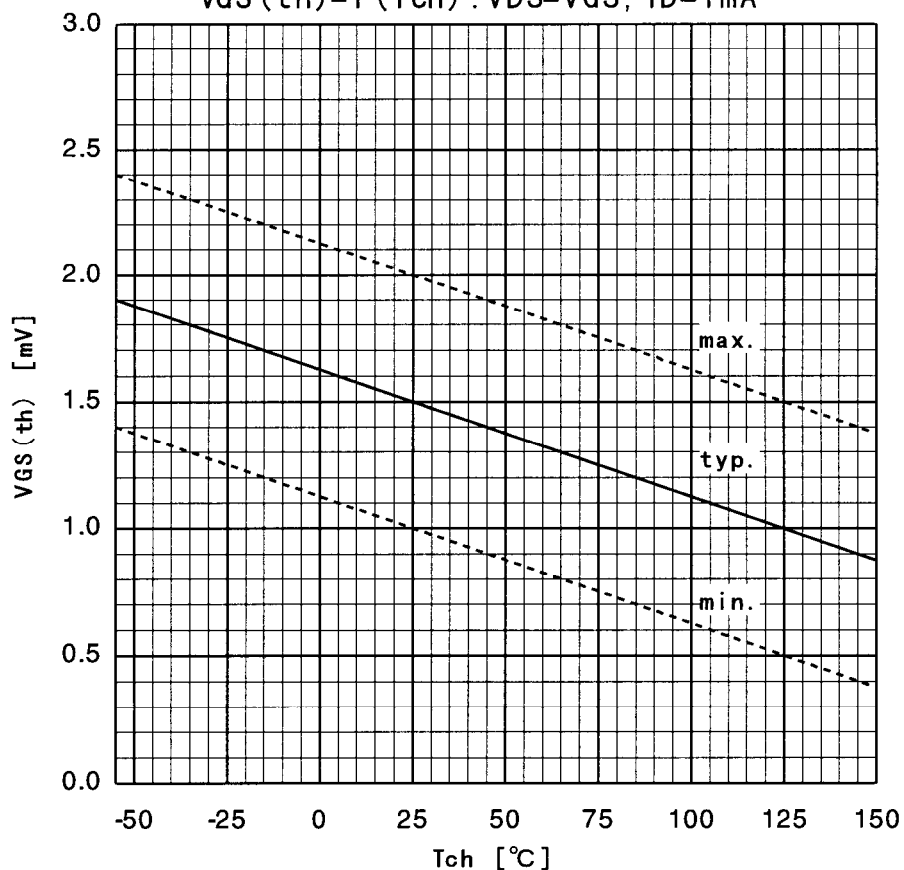
# Drain-Source On-state Resistance

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



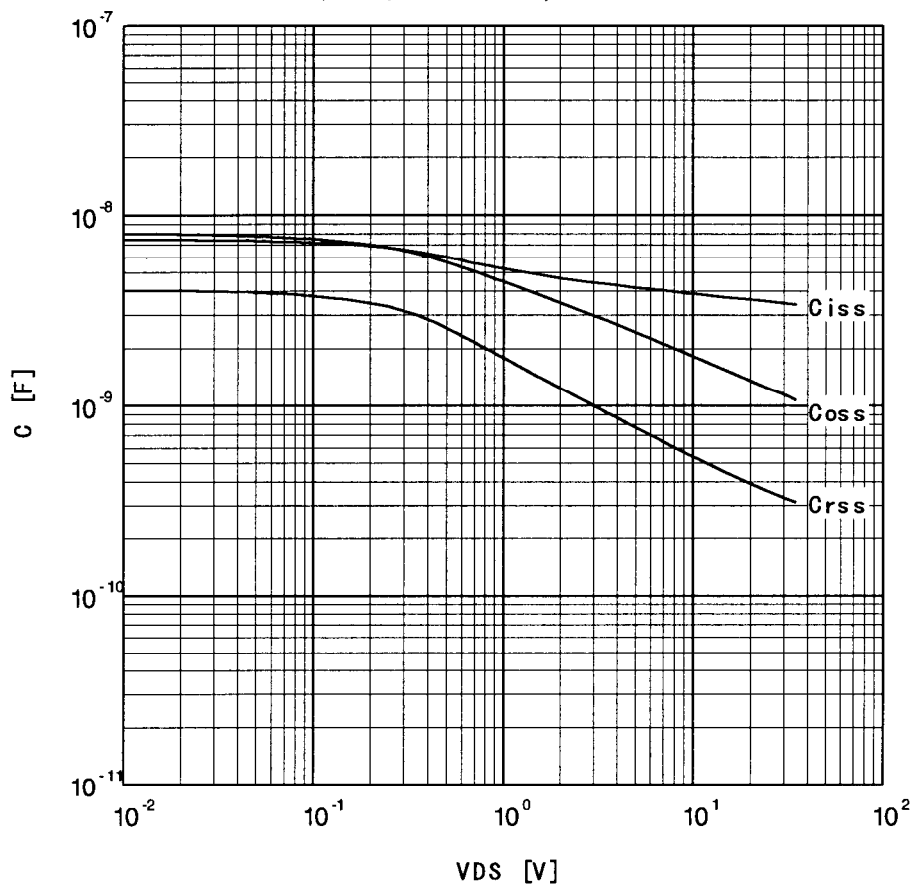
# Gate Threshold Voltage vs. Tch

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

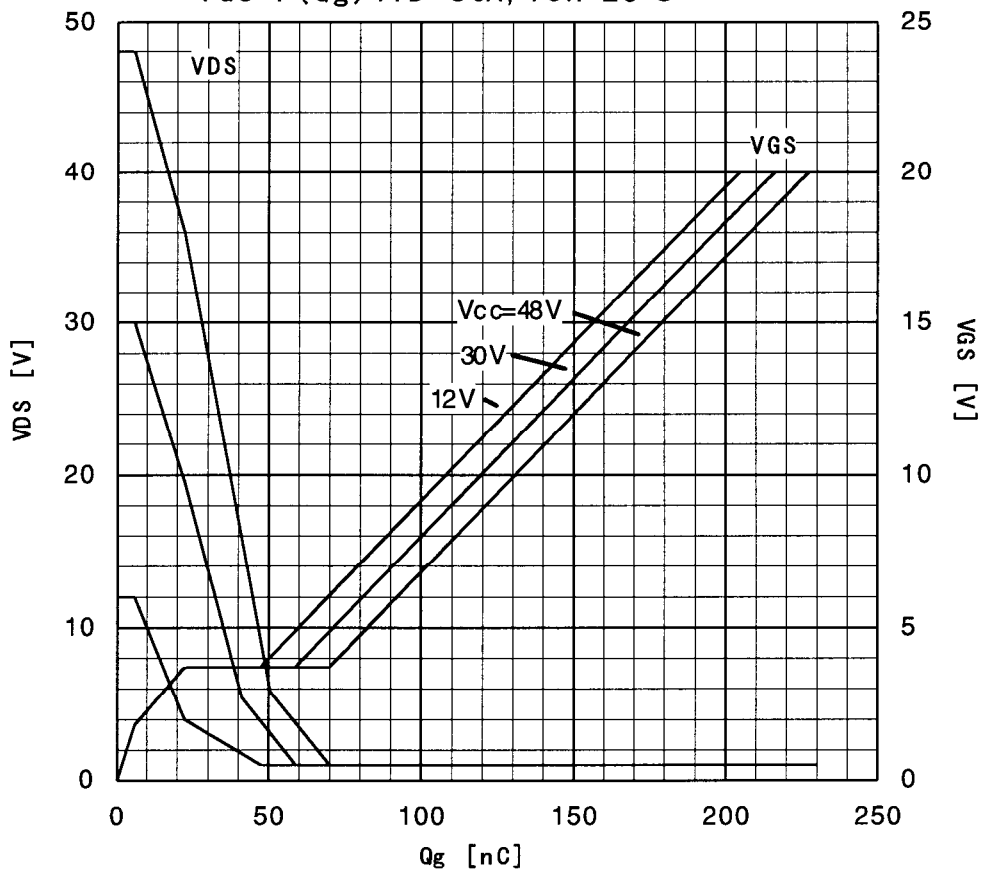


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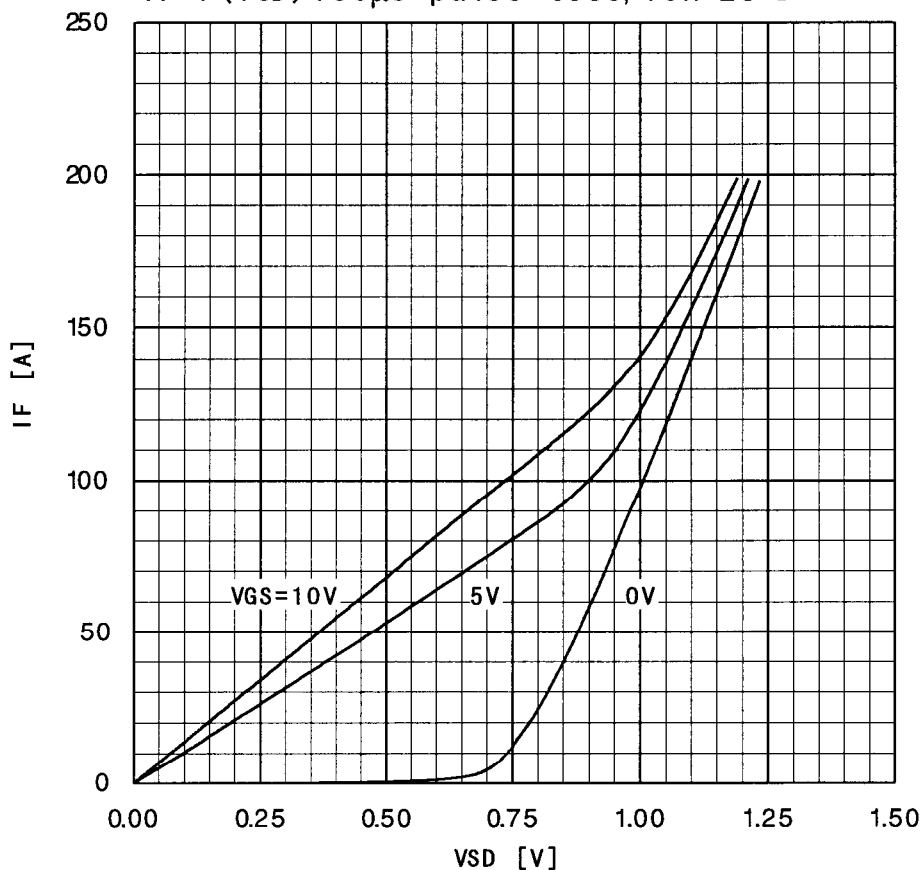
Typical Capacitance  
 $C=f(V_{DS}) : V_{GS}=0V, f=1MHz$



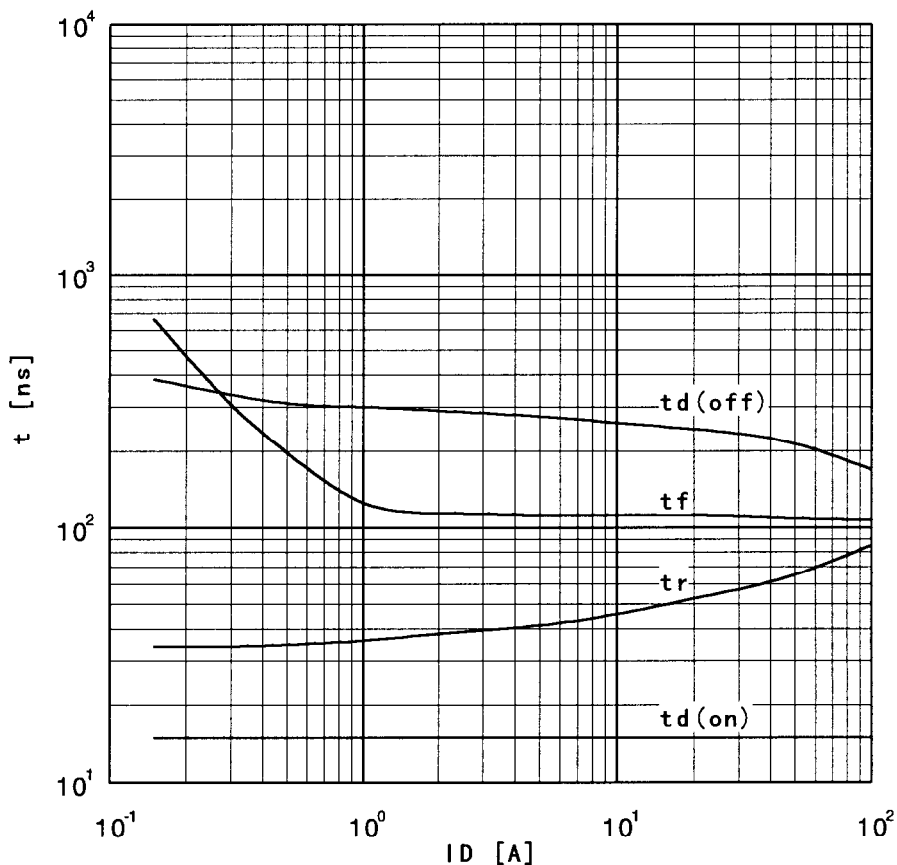
Typical Gate Charge Characteristics  
 $V_{GS}=f(Q_g) : I_D=80A, T_{ch}=25^\circ C$



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

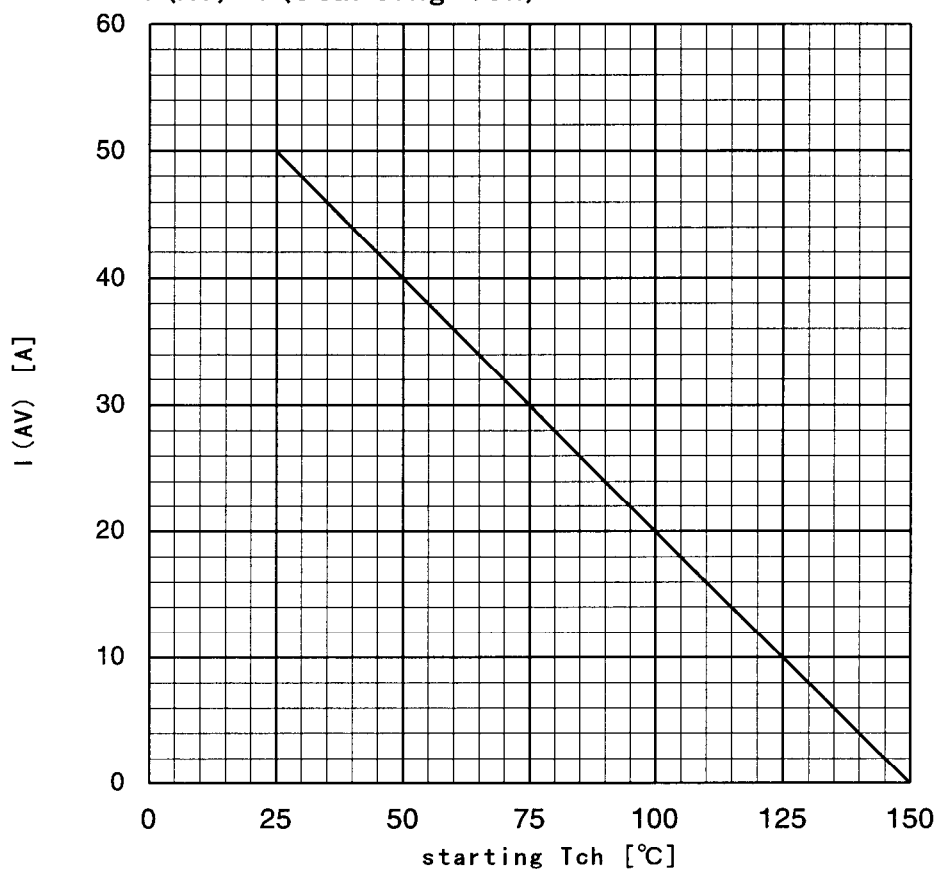


Typical Switching Characteristics vs.  $I_D$   
 $t = f(I_D) : V_{CC} = 30V, V_{GS} = 10V, R_G = 10\Omega$



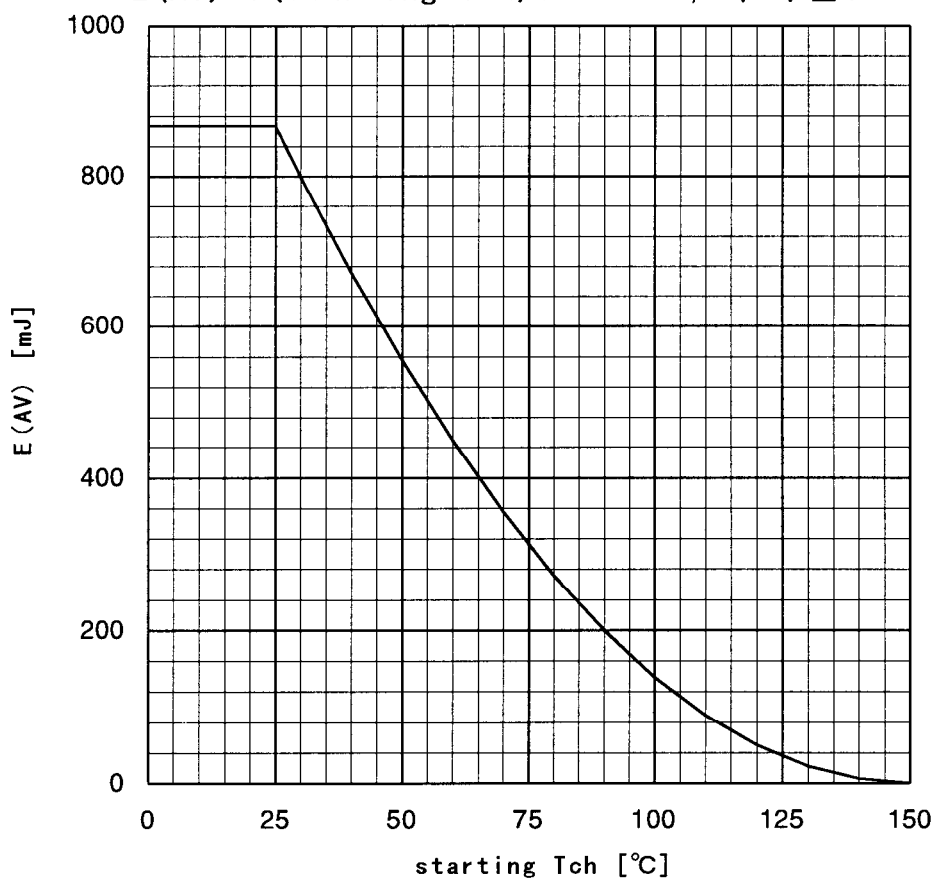
# Maximum Avalanche Current vs. starting Tch

$$I(AV)=f(\text{starting Tch})$$



## Maximum Avalanche Energy vs. starting Tch

$$E(AV)=f(\text{starting Tch}):V_{cc}=24V, I(AV) \leq 50A$$



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