

SPECIFICATION

Device Name : Power MOSFET

Type Name : 2SK3102-01R

Spec. No. : **MS5 F4207**

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Fuji Electric Co.,Ltd.
Matsumoto Factory

	DATE	NAME	APPROVED	
DRAWN	Feb.-13-'98	C. Ota		Fuji Electric Co.,Ltd.
CHECKED	Feb.-15-'98	<i>[Signature]</i>	<i>[Signature]</i>	
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- 1.Scope** This specifies Fuji Power MOSFET 2SK3102-01R
- 2.Construction** N-Channel enhancement mode power MOSFET
- 3.Applications** for Switching
- 4.Outview** TO-3PF Outview See to 5/12 page

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

Description	Symbol	Characteristics	Unit	Remarks
Drain-Source Voltage	V _{DS}	600	V	
Continuous Drain Current	I _D	±10	A	
Pulsed Drain Current	I _{DP}	±36	A	
Gate-Source Voltage	V _{GS}	±35	V	
Repetitive or non-repetitive	I _{AR}	10	A	T _{ch} ≤ 150°C
Avalanche energy	E _{AS}	433.7	mj	
Maximum Power Dissipation	P _D	80	W	
Operating and Storage	T _{ch}	150	°C	
Temperature range	T _{stg}	-55 to +150	°C	

*L=7.95mH, V_{cc}=60V

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	600			V
Gate Threshold Voltage	V _{GS(th)}	I _D =1mA V _{DS} =V _{GS}	3.5	4.0	4.5	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =600V V _{GS} =0V		10	500	μA
		T _{ch} =25°C				
		T _{ch} =125°C		0.2	1.0	mA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±30V V _{DS} =0V		10	100	nA
Drain-Source On-State Resistance	R _{DS(on)}	I _D =5A V _{GS} =10V		0.85	1	Ω

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Dynamic Ratings

Description	Symbol	Conditions	min.	typ.	max.	Unit
Forward Transconductance	g_{fs}	$I_D=5A$ $V_{DS}=25V$	3.0	6.0		S
Input Capacitance	C_{iss}	$V_{DS}=25V$		1100	1700	pF
Output Capacitance	C_{oss}	$V_{GS}=0V$		170	260	
Reverse Transfer Capacitance	C_{rss}	$f=1MHz$		75	120	
Turn-On Time	$t_d(on)$	$V_{cc}=300V$		25	40	ns
	t_r	$V_{GS}=10V$		70	110	
Turn-Off Time	$t_d(off)$	$I_D=10A$		75	120	
	t_f	$R_{GS}=10\Omega$		40	60	

Reverse Diode

Description	Symbol	Conditions	min.	typ.	max.	Unit
Avalanche Capability	I_{AV}	$L=1.19mH$ $T_{ch}=25^\circ C$ See Fig.1 and Fig.2	10			A
Diode Forward On-Voltage	V_{SD}	$I_F=2 \times I_{DR}$ $V_{GS}=0V$ $T_{ch}=25^\circ C$		1.0	1.5	V
Reverse Recovery Time	t_{rr}	$I_F=I_{DR}$ $V_{GS}=0V$		500		ns
Reverse Recovery Charge	Q_{rr}	$-di/dt=100A/\mu s$ $T_{ch}=25^\circ C$		6.5		μC

7.Thermal Resistance

Description	Symbol	min.	typ.	max.	Unit
Channel to Case	$R_{th}(ch-c)$			1.56	$^\circ C/W$
Channel to Ambient	$R_{th}(ch-a)$			30.0	$^\circ C/W$

Fig.1 Test circuit

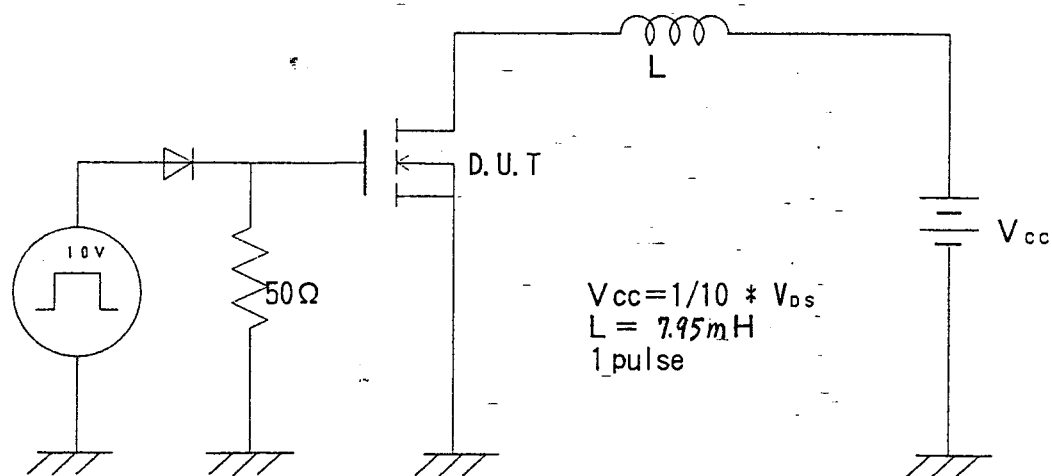
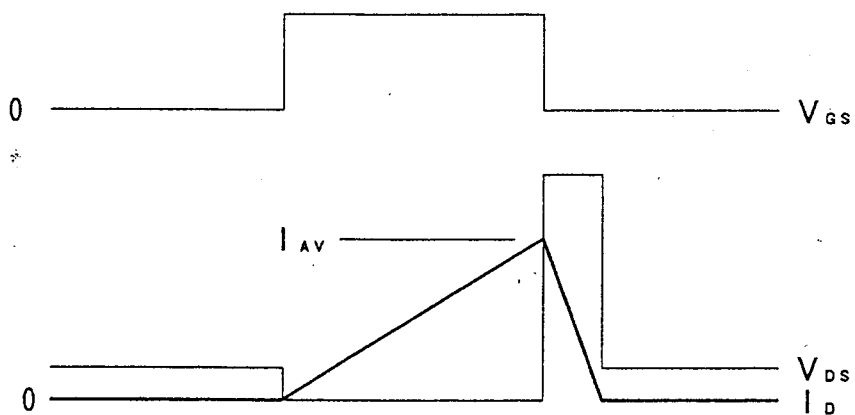
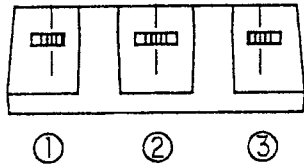
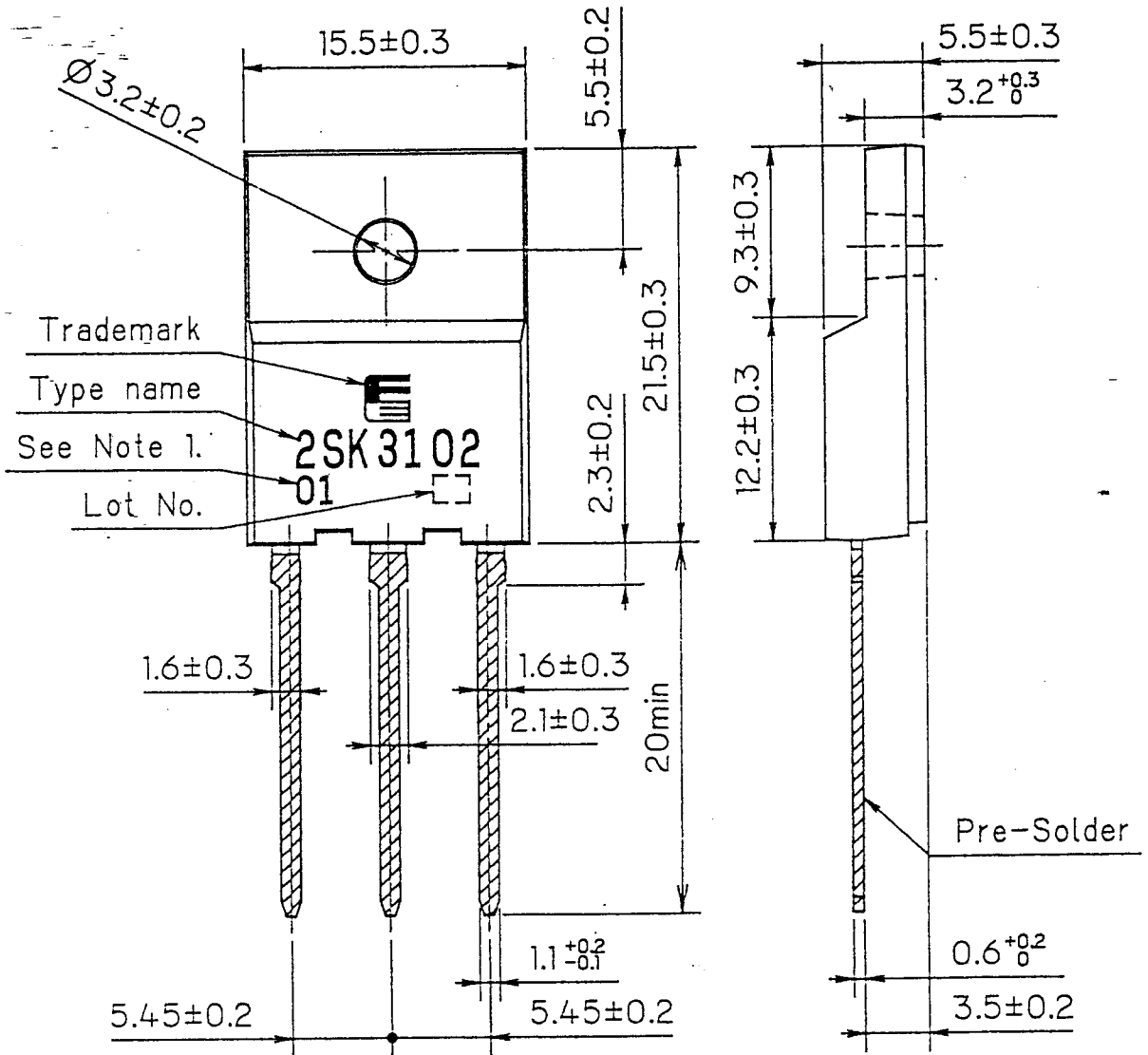


Fig.2 Operating waveforms



FUJI POWER MOSFET

TYPE : 2SK3102-01R



CONNECTION

Note 1. Guaranteed mark of avalanche ruggedness.

- ① GATE
- ② DRAIN
- ③ SOURCE

DIMENSIONS ARE IN MILLIMETERS.

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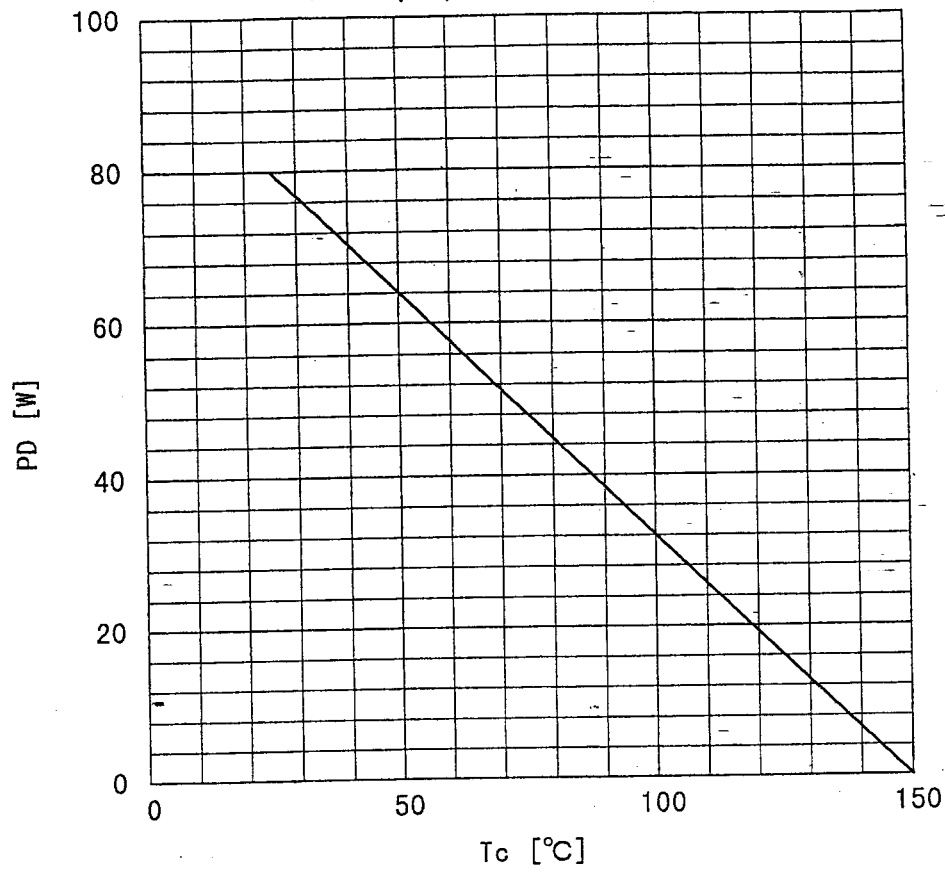
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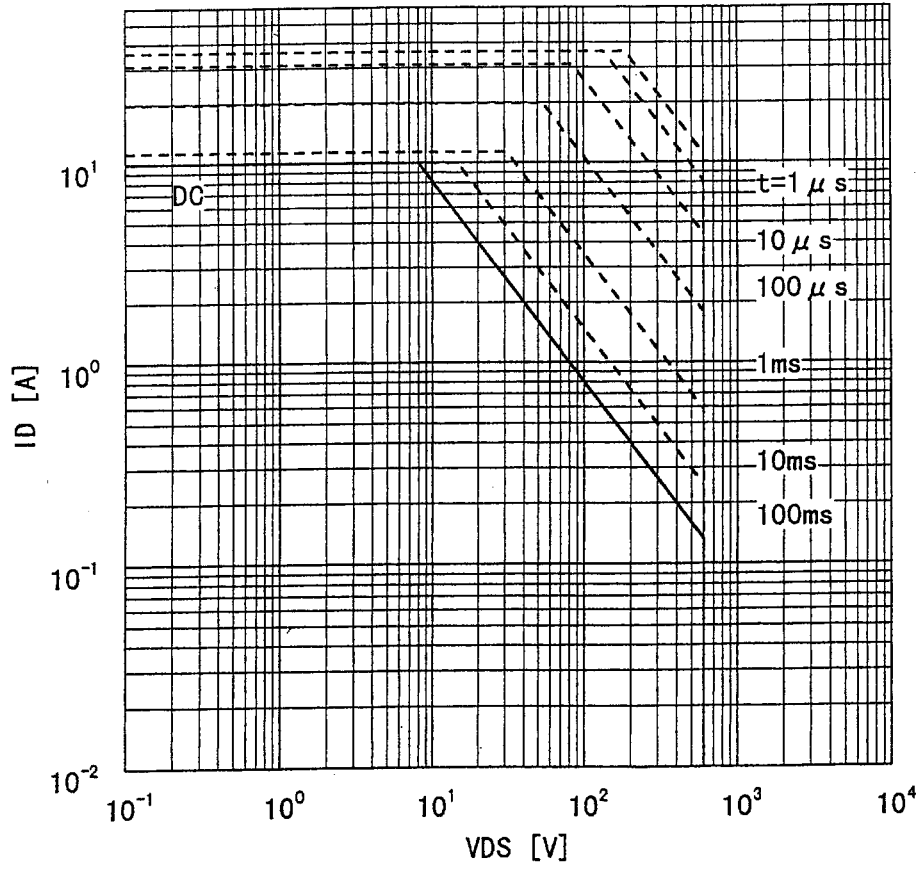
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Power Dissipation
 $PD=f(T_c)$



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



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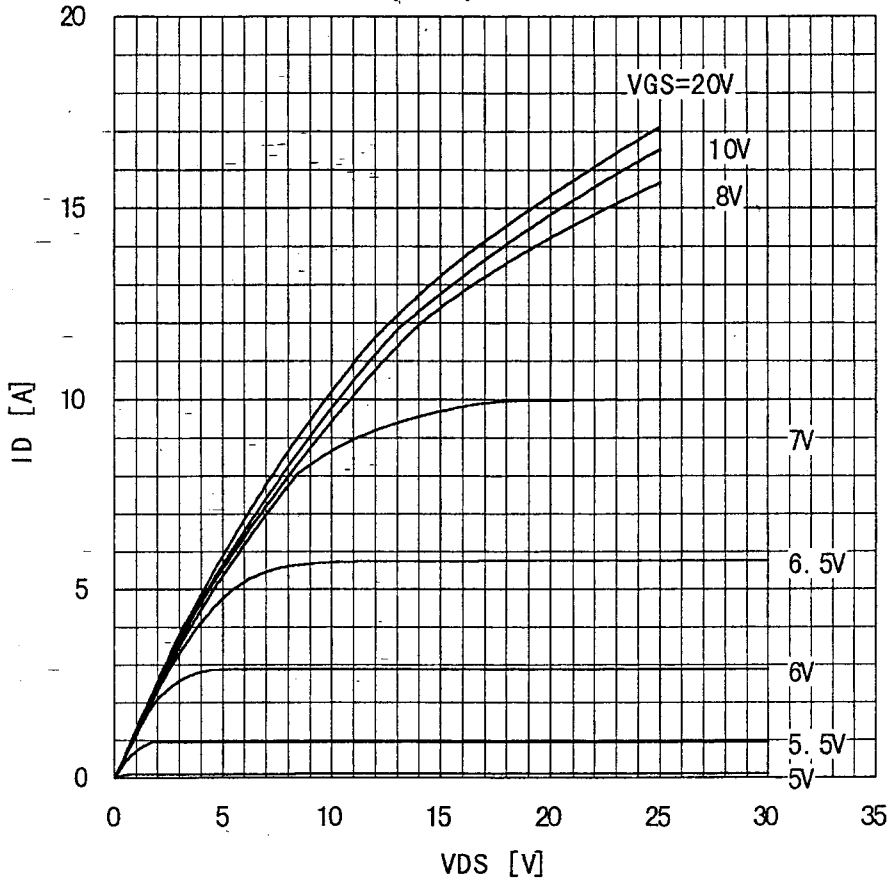
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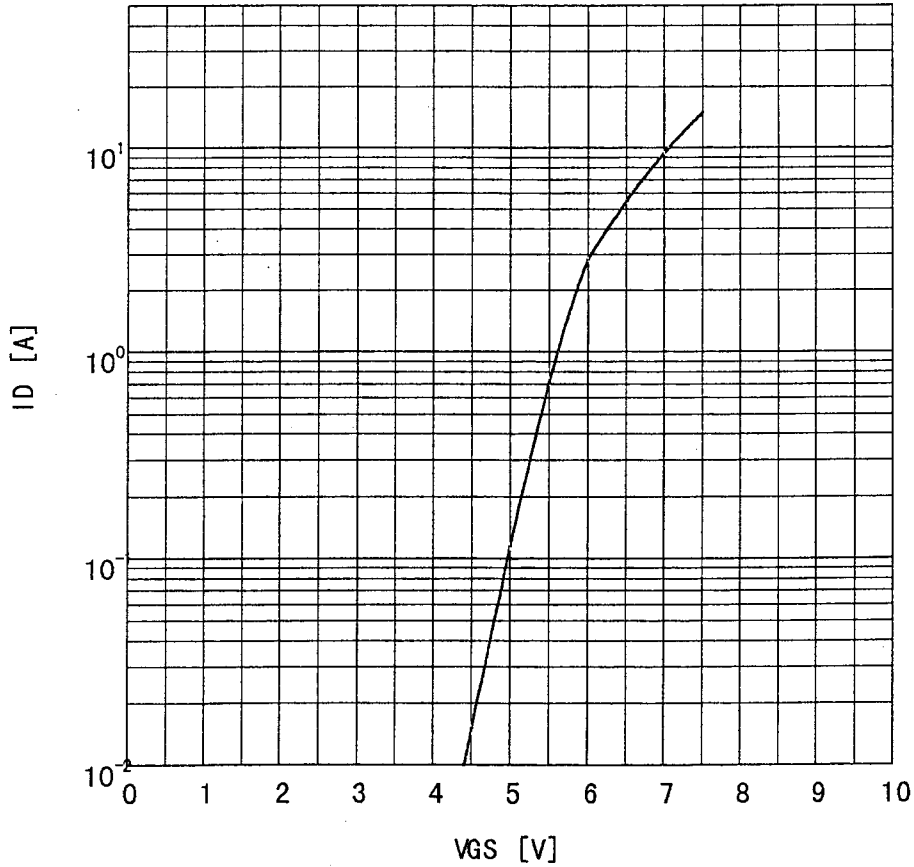
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Typical output characteristics
 $I_D = f(V_{DS}) : 80 \mu s$ pulse test, $T_c = 25^\circ C$



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



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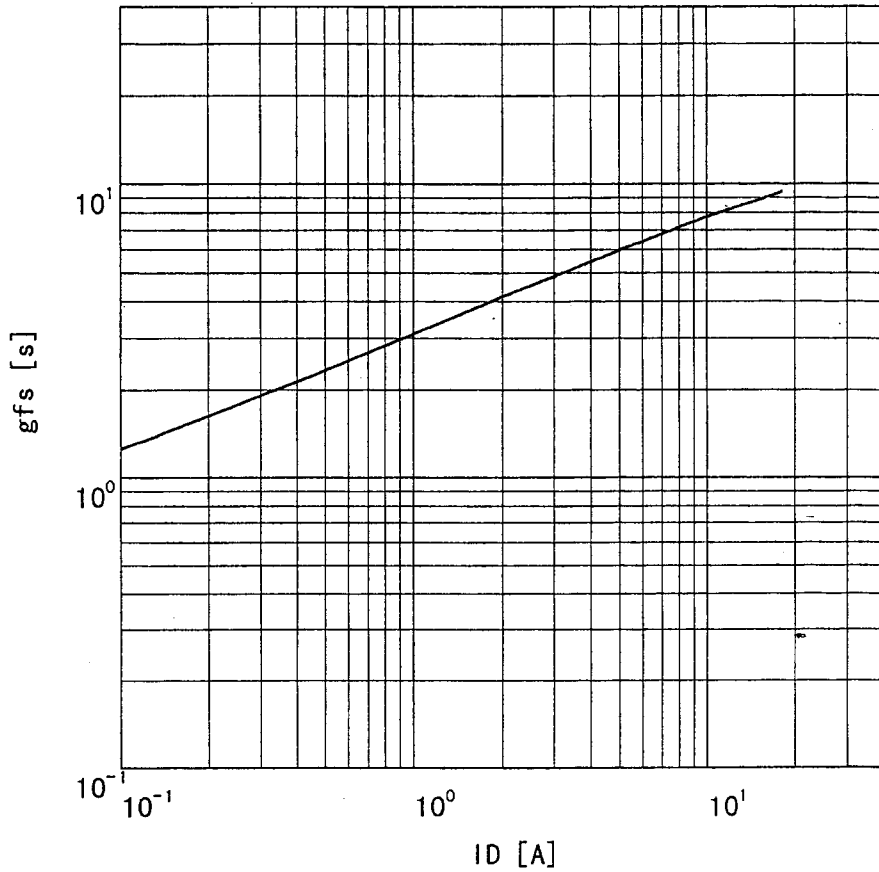
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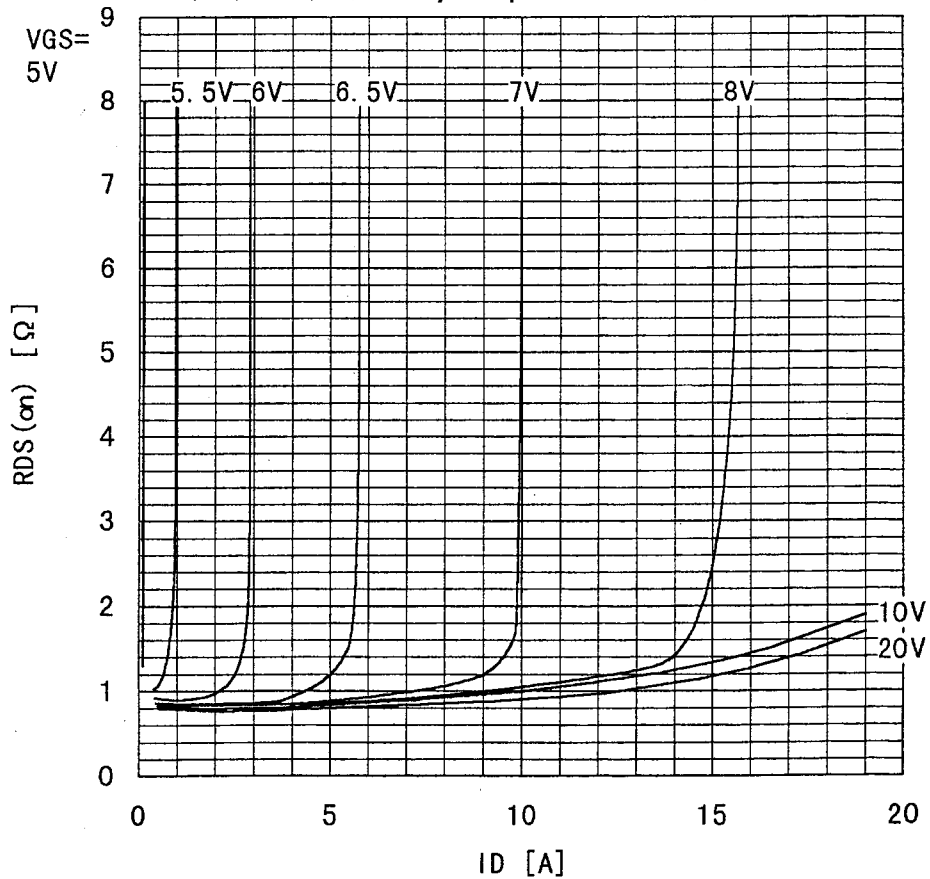
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Typical forward transconductance
 $g_{fs} = f(I_D) : 80 \mu s$ pulse test, $V_{DS} = 25V$, $T_{ch} = 25^\circ C$



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



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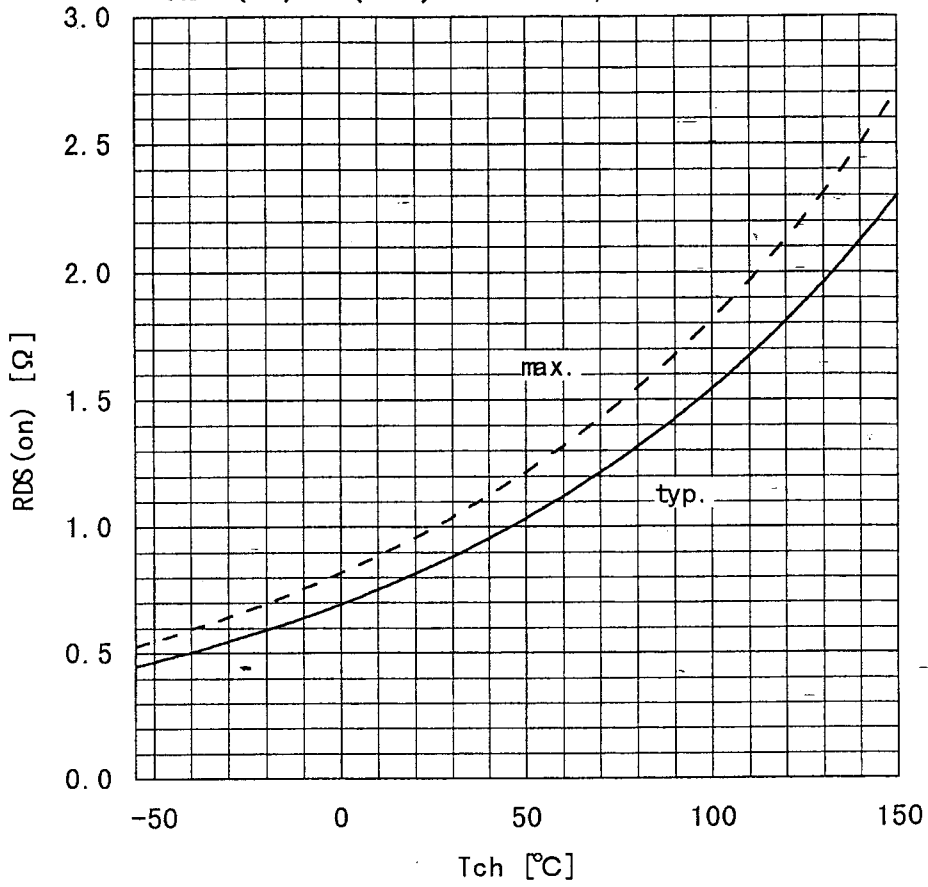
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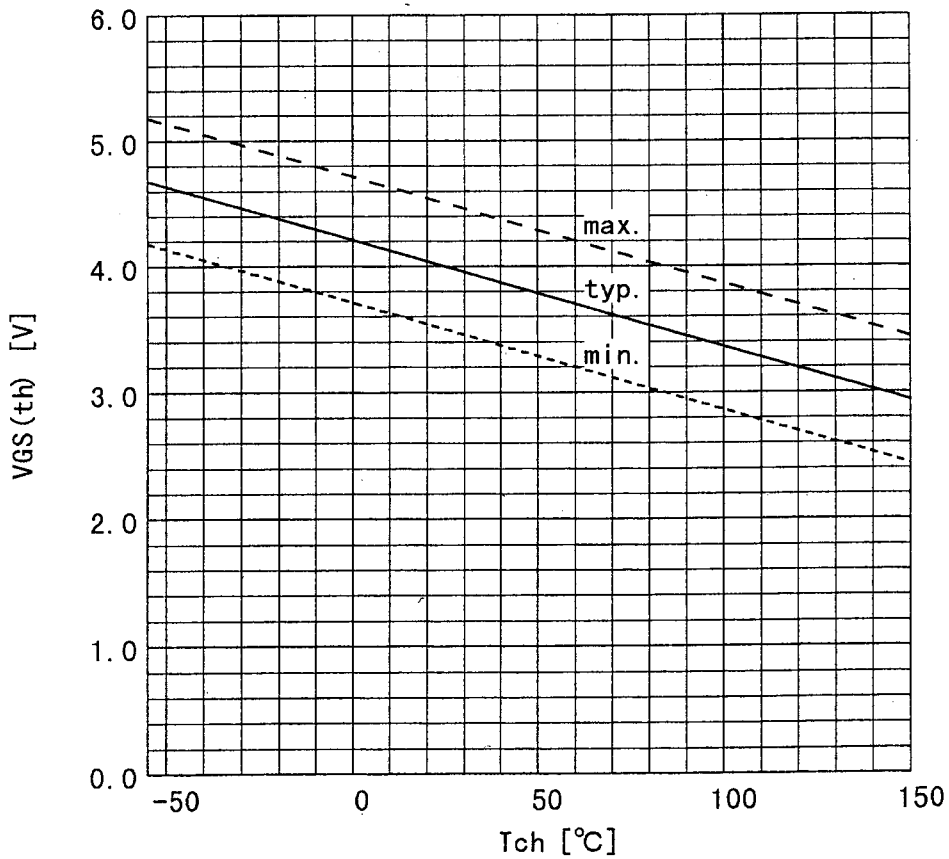
Drain-source on-state resistance

$R_{DS(on)} = f(T_{ch}) : I_D = 4.5A, V_{GS} = 10V$



Gate threshold voltage

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



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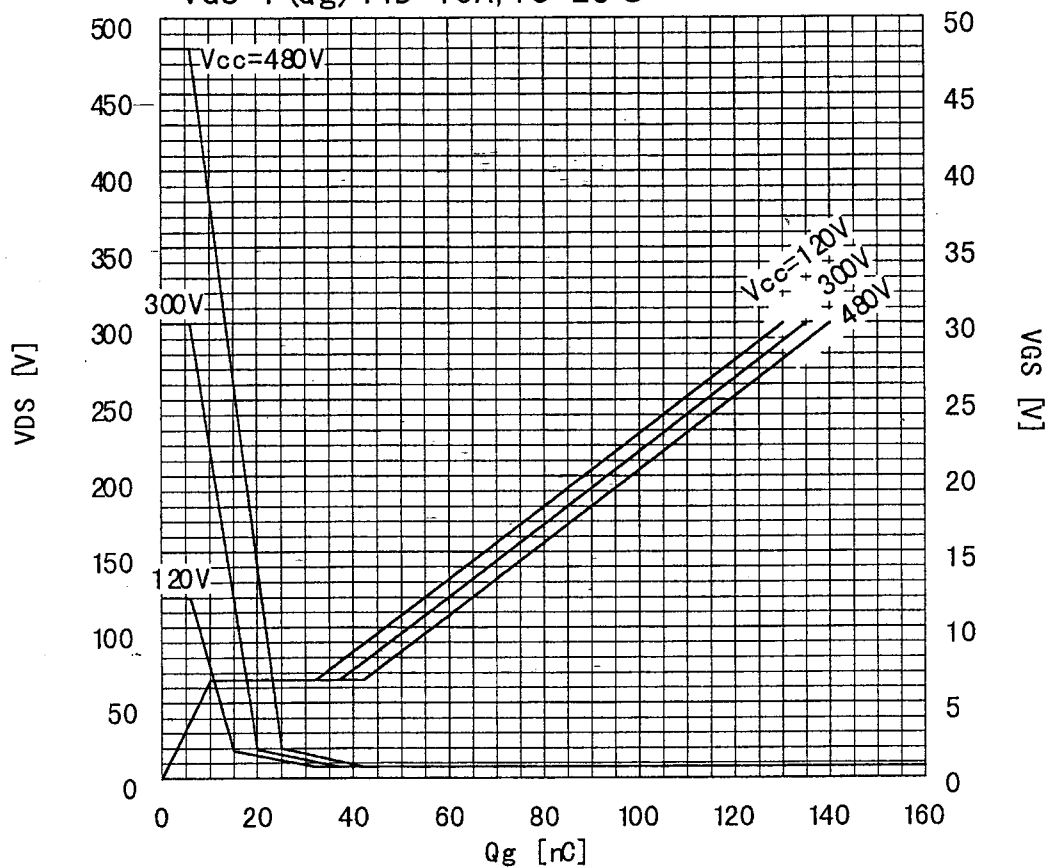
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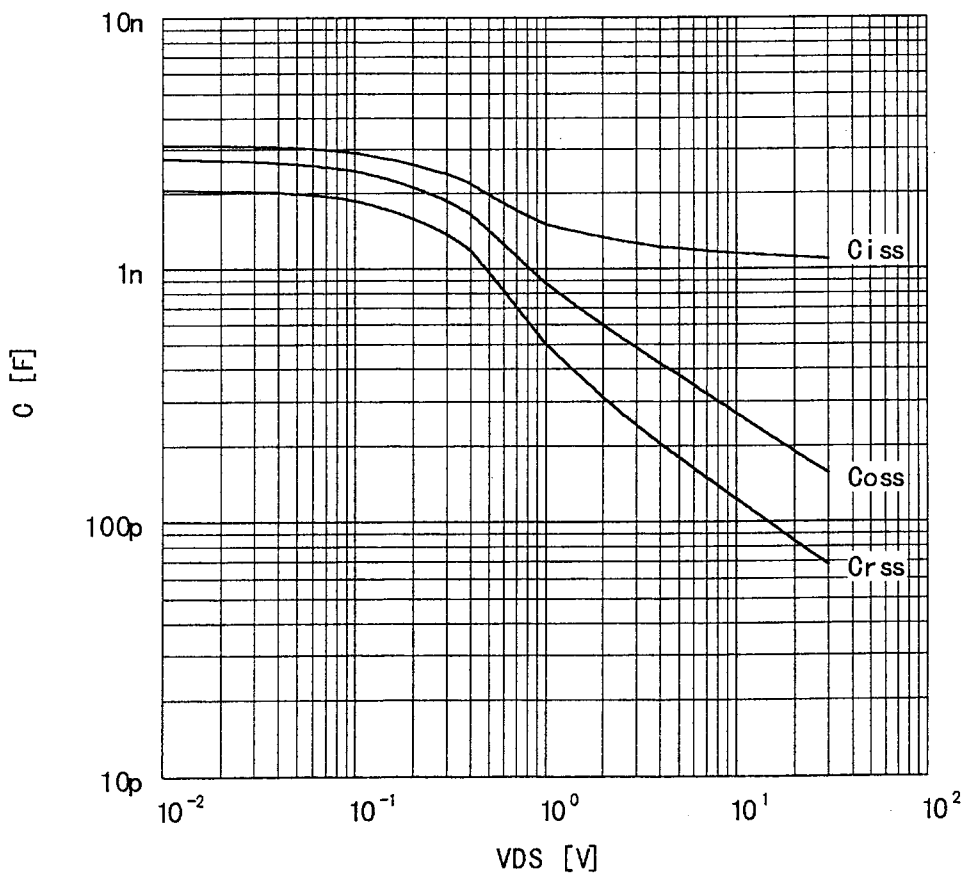
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Typical gate charge characteristic
 $V_{GS} = f(Q_g) : I_D = 10A, T_c = 25^\circ C$

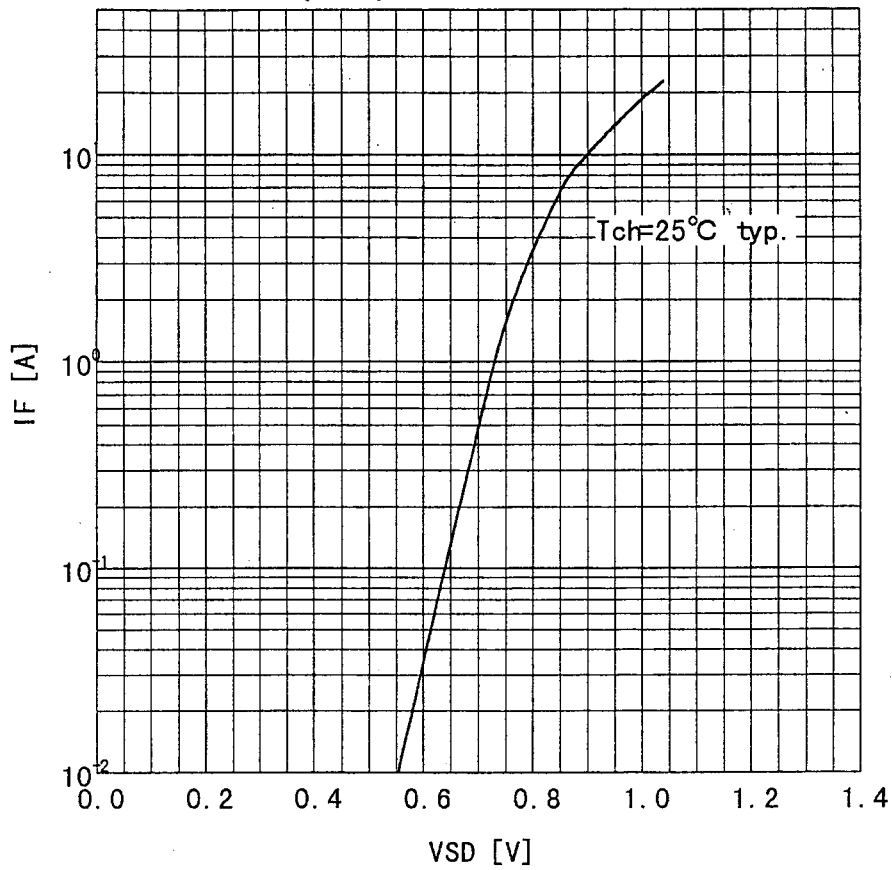


Typical capacitances

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

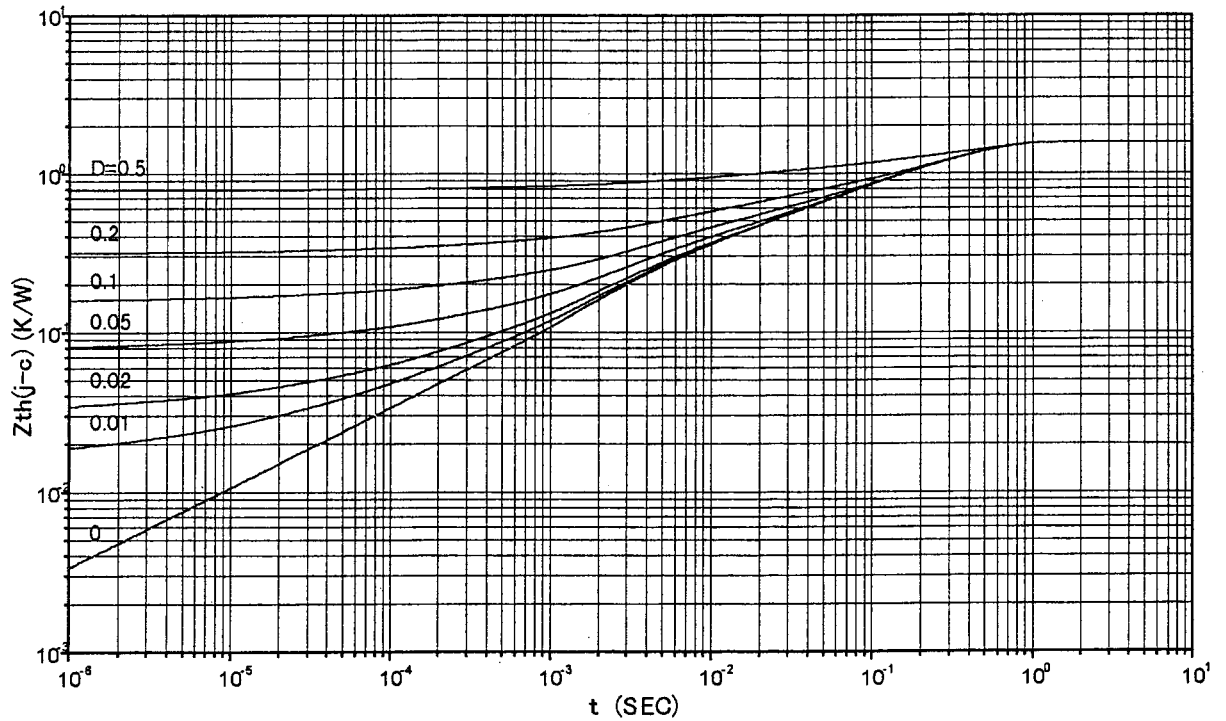


Forward characteristic of reverse of diode
 $I_F=f(V_{SD}) : 80 \mu s$ pulses test, $V_{GS}=0V$



TO-3PF/80W Transient Thermal Impedance

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



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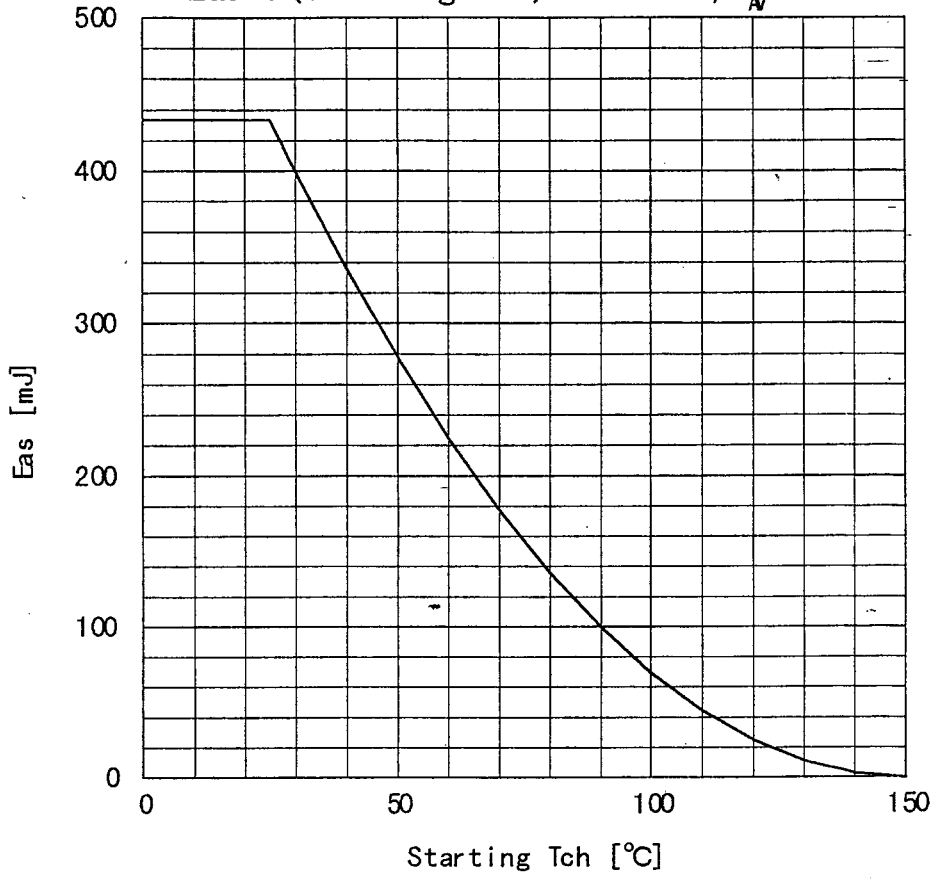
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Avalanche energy derating
 $E_{as} = f(\text{starting } T_{ch}) : V_{CC} = 60V, I_A = 10A$



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