

# SPECIFICATION

DEVICE NAME : Power MOSFET

TYPE NAME : 2SK2808-01MR

SPEC. NO. :

Fuji Electric Co.,Ltd.

This Specification is subject to change without notice.

	DATE	NAME	APPROVED	Fuji Electric Co.,Ltd.	
DRAWN					
CHECKED					
				DWG. NO.	1/13

- 1.Scope This specifies Fuji Power MOSFET 2SK2808-01MR
- 2.Construction N-Channel enhancement mode power MOSFET
- 3.Applications for Switching
- 4.Outview To-220F 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 <sub>DS</sub>	30	V	
Continuous Drain Current	I <sub>D</sub>	±35	A	
Pulsed Drain Current	I <sub>DP</sub>	±140	A	
Gate-Source Voltage	V <sub>GS</sub>	±16	V	
Maximum Avalanche Energy	E <sub>AV</sub>	129.3	mJ	*1
Maximum Power Dissipation	P <sub>D</sub>	20	W	
Operating and Storage	T <sub>ch</sub>	150	°C	
Temperature range	T <sub>stg</sub>	-55 to +150	°C	

\*1 L=0.070mH, V<sub>CC</sub>=12V

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

Static Ratings

Description	Symbol	Conditions	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> =1mA V <sub>GS</sub> =0V	30			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	I <sub>D</sub> =1mA V <sub>DS</sub> =V <sub>GS</sub>	1.0	1.5	2.0	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =30V V <sub>GS</sub> =0V		10	500	μA
		T <sub>ch</sub> =25°C				
		T <sub>ch</sub> =125°C		0.2	1.0	mA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±16V V <sub>DS</sub> =0V		10	100	nA
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	I <sub>D</sub> =17.5A		22	30	mΩ
		V <sub>GS</sub> =4V				
		V <sub>GS</sub> =10V		14	20	mΩ

### Dynamic Ratings

Description	Symbol	Conditions	min.	typ.	max.	Unit
Forward Transconductance	$g_{fs}$	$I_D=17.5A$ $V_{DS}=25V$	16	33		S
Input Capacitance	$C_{iss}$	$V_{DS}=25V$		1100	1650	pF
Output Capacitance	$C_{oss}$	$V_{GS}=0V$		550	830	
Reverse Transfer Capacitance	$C_{rss}$	$f=1MHz$		240	360	
Turn-On Time	$t_{d(on)}$	$V_{cc}=15V$		9	15	ns
	$t_r$	$V_{GS}=10V$		15	23	
Turn-Off Time	$t_{d(off)}$	$I_D=35A$		75	115	
	$t_f$	$R_{GS}=10\Omega$		50	75	

### 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	35			A
Diode Forward On-Voltage	$V_{SD}$	$I_F=2 \times I_{BR}$ $V_{GS}=0V$ $T_{ch}=25^\circ C$		0.98	1.71	V
Reverse Recovery Time	$t_{rr}$	$I_F=2 \times I_{BR}$		50		ns
Reverse Recovery Charge	$Q_{rr}$	$-di/dt=100A/\mu s$ $T_{ch}=25^\circ C$		0.08		$\mu C$

### 7. Thermal Resistance

Description	Symbol	min.	typ.	max.	Unit
Channel to Case	$R_{th(ch-c)}$			6.25	$^\circ C/W$
Channel to Ambient	$R_{th(ch-a)}$			62.5	$^\circ C/W$

Fig.1 Test circuit

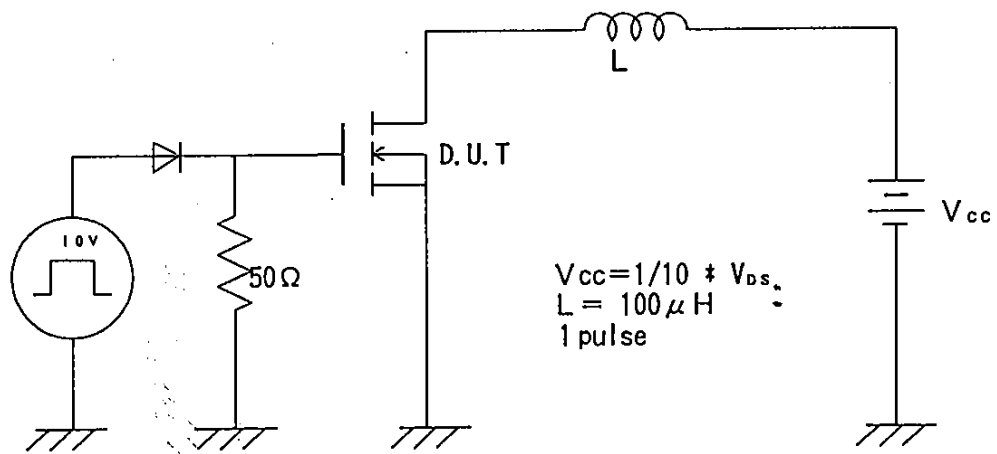
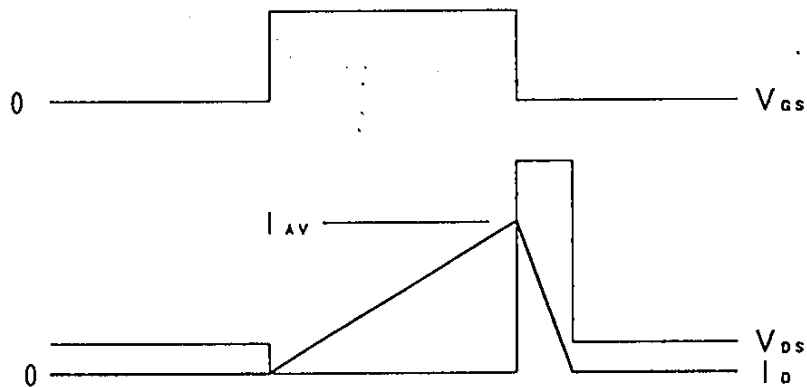
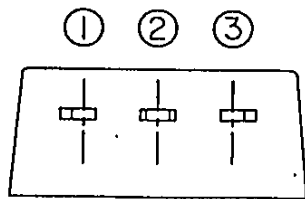
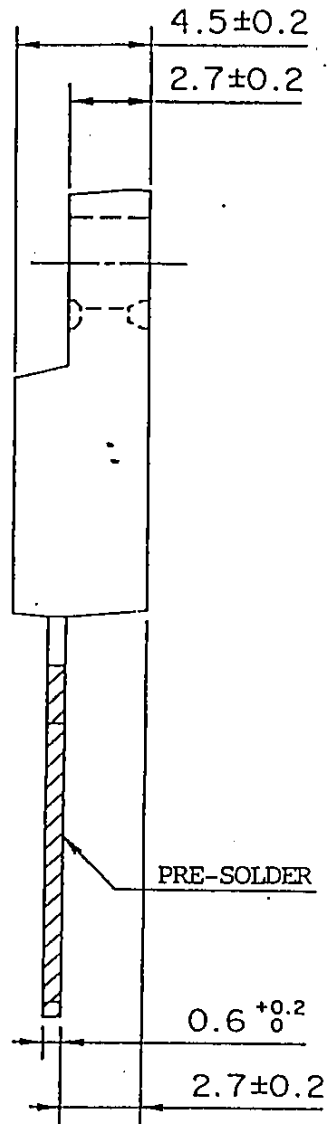
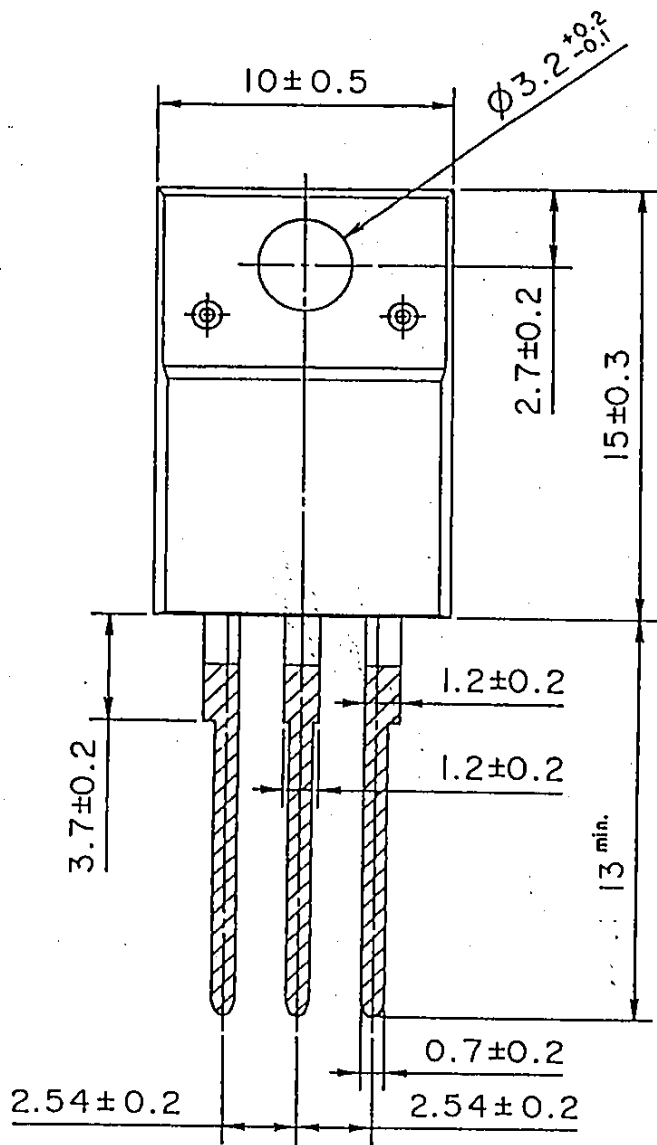


Fig.2 Operating waveforms



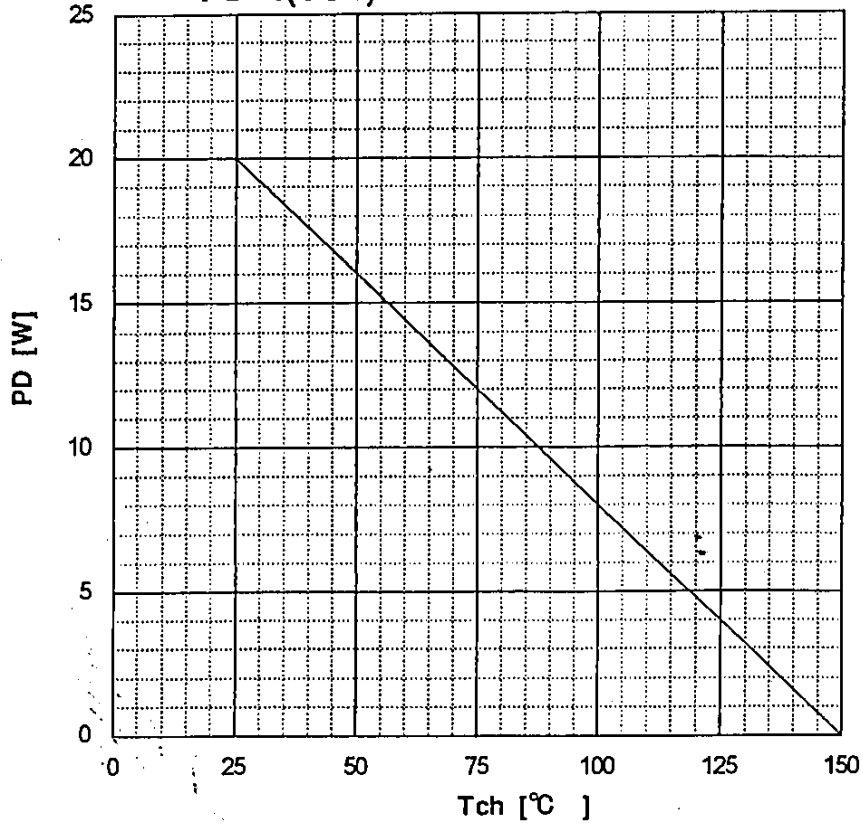


CONNECTION

- 1: GATE
- 2: DRAIN
- 3: SOURCE

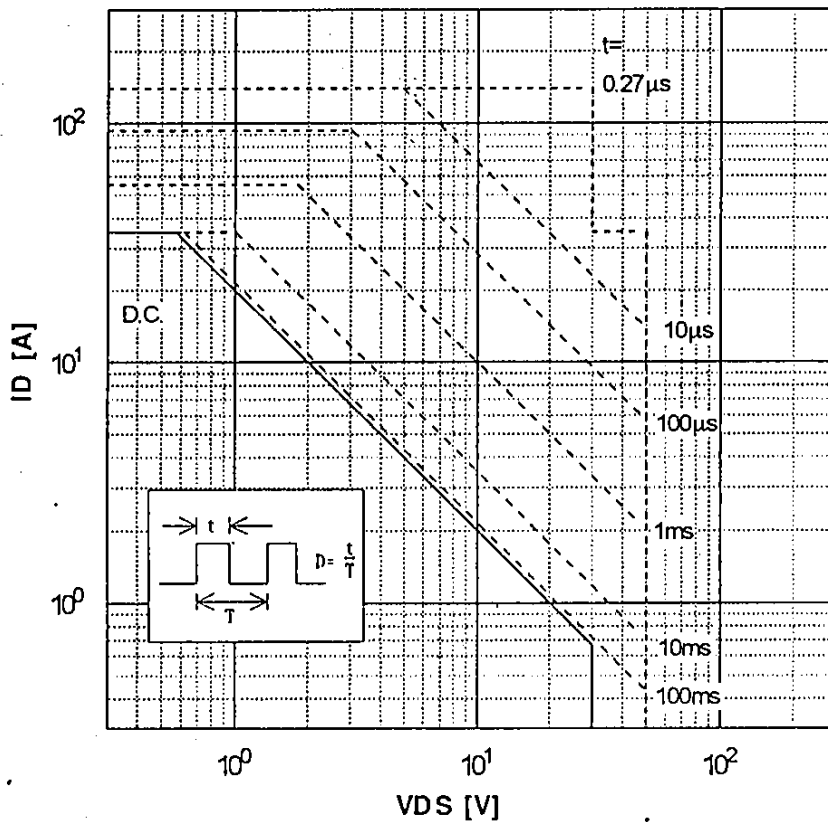
### Allowable Power Dissipation vs. T<sub>ch</sub>

$PD=f(T_{ch})$



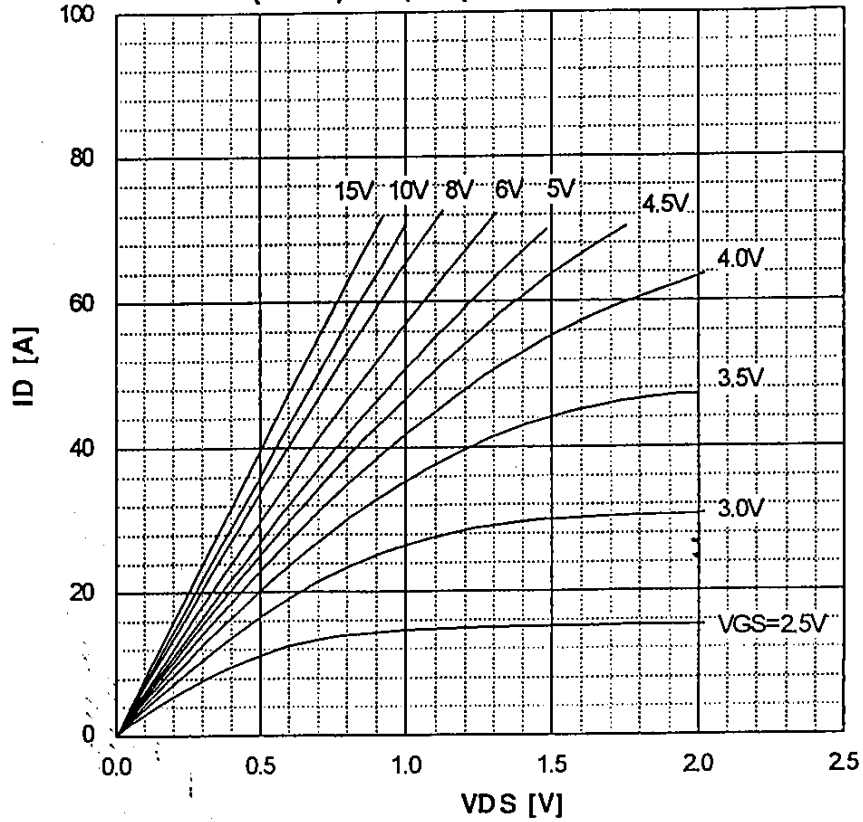
### Safe operating area

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



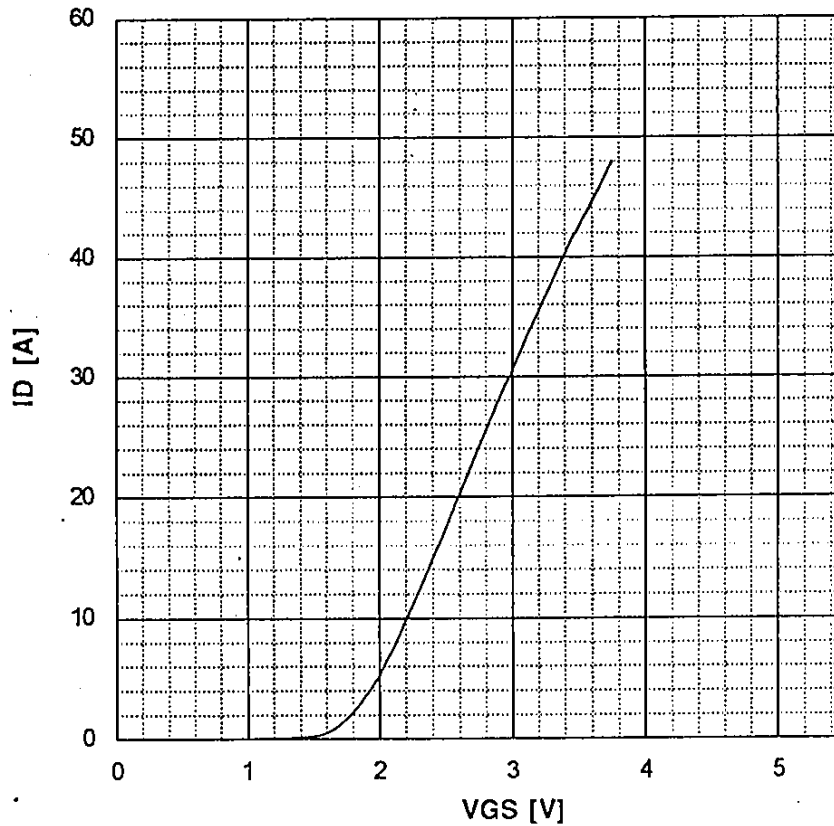
### Typical Output Characteristics

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



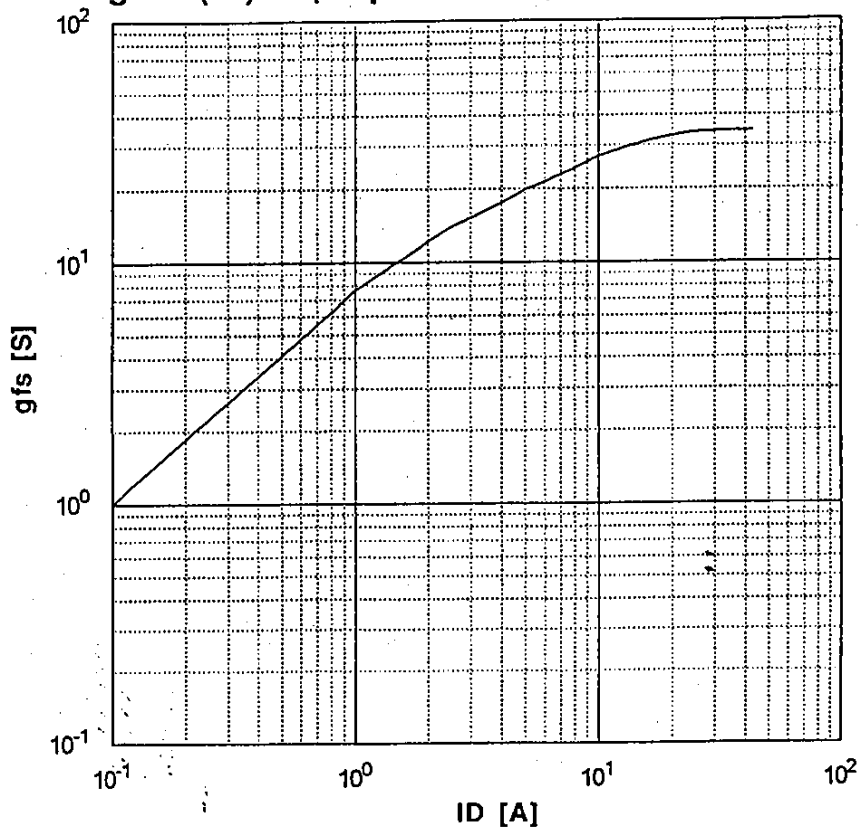
### Typical Transfer Characteristic

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



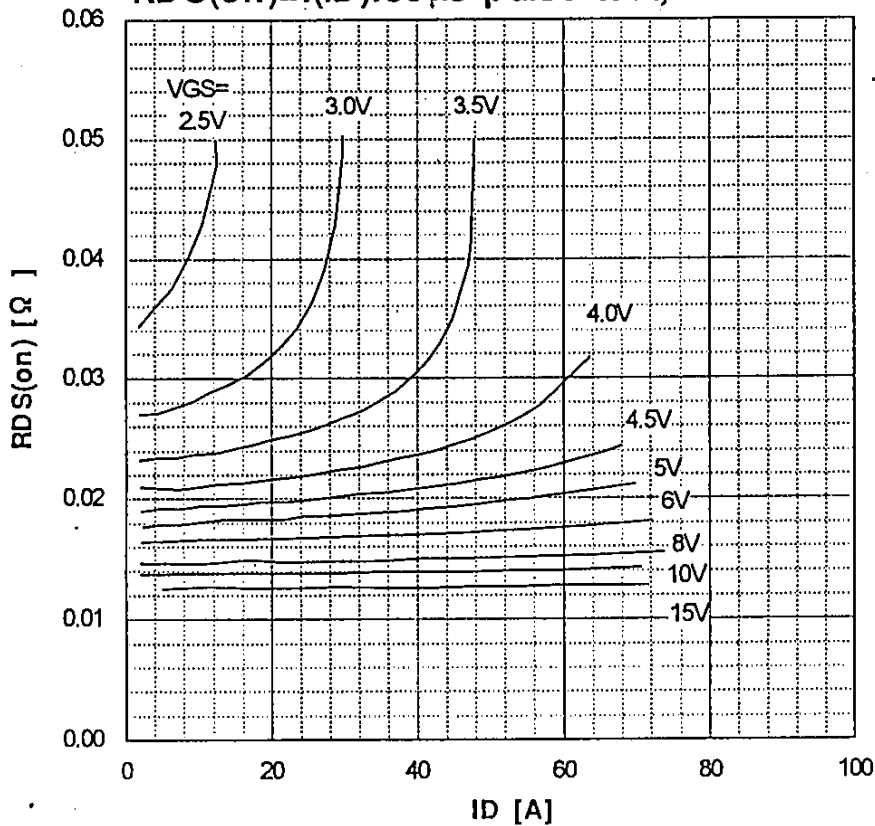
### Typical Transconductance

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



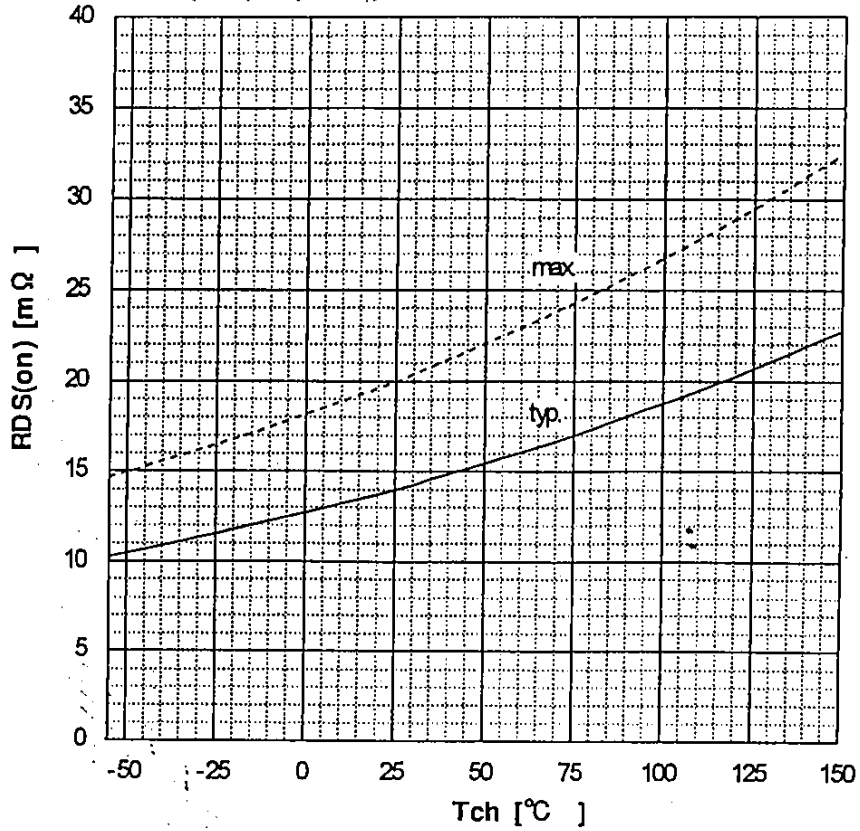
### Typical Drain-Source on-state Resistance vs. $I_D$

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



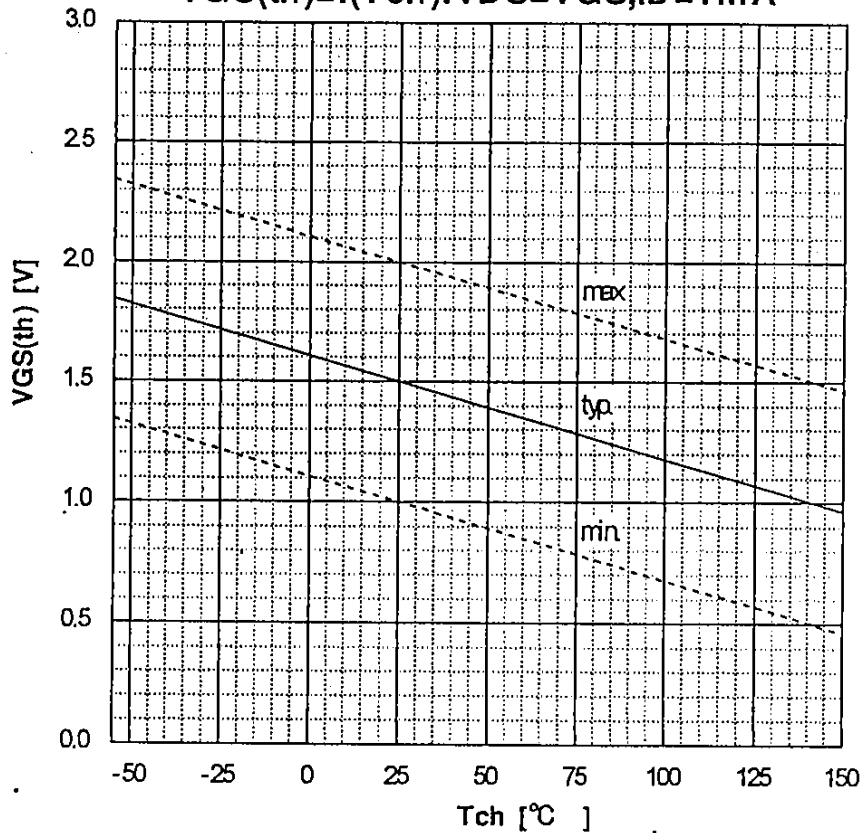
### Drain-Source On-state Resistance vs. T<sub>ch</sub>

$R_{DS(on)} = f(T_{ch}) : I_D = 17.5A, V_{GS} = 10V$

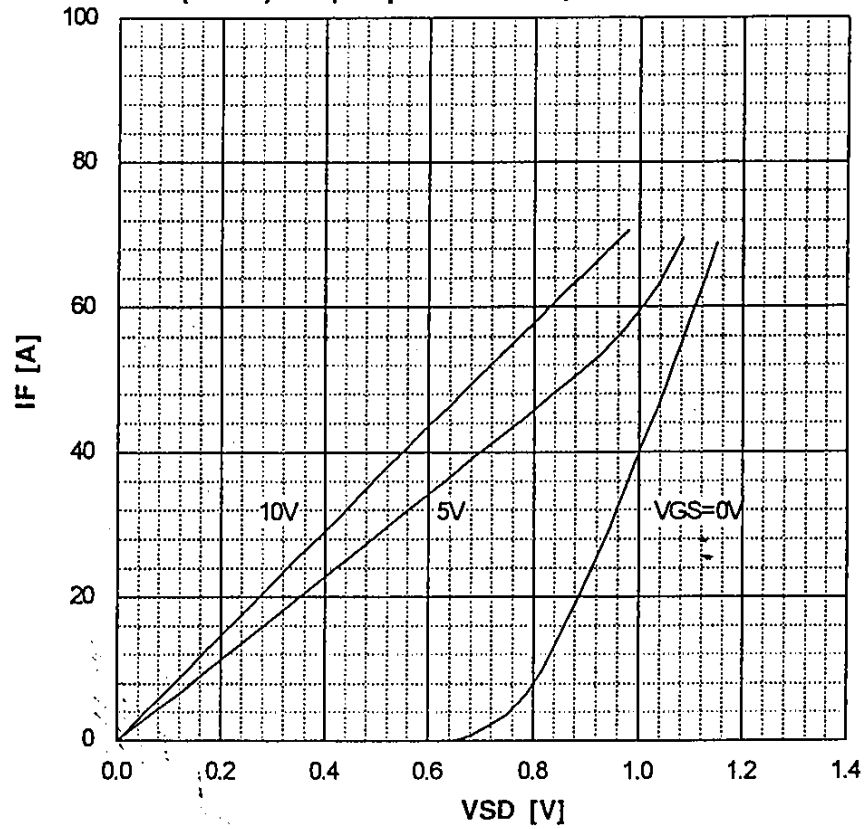


### Gate Threshold Voltage vs. T<sub>ch</sub>

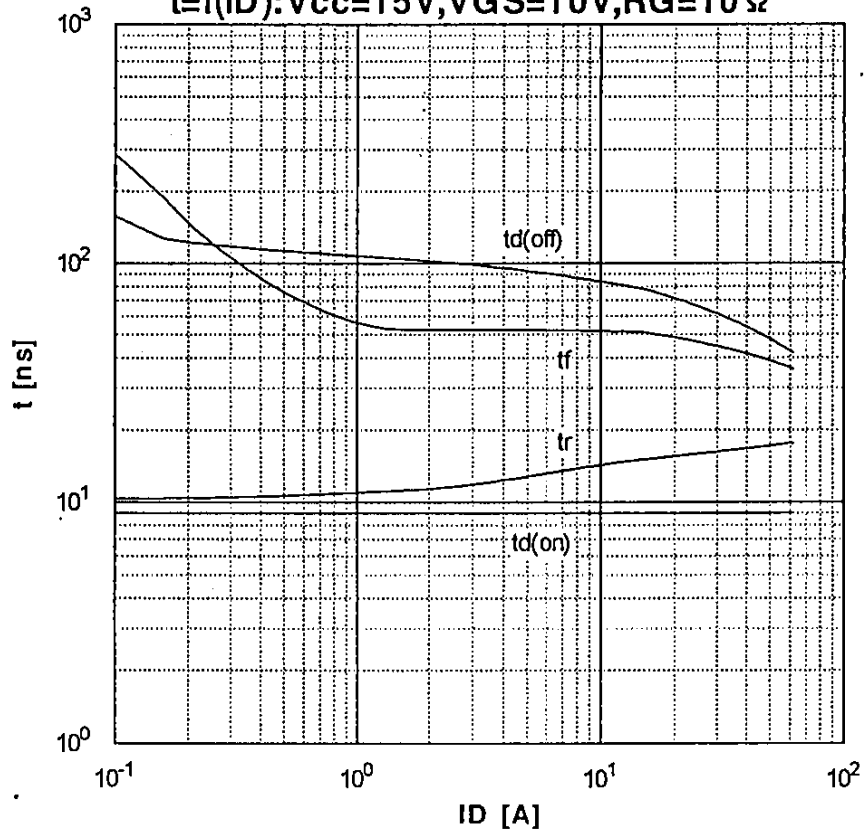
$V_{GS(th)} = f(T_{ch}) : V_{DS} = V_{GS}, I_D = 1mA$



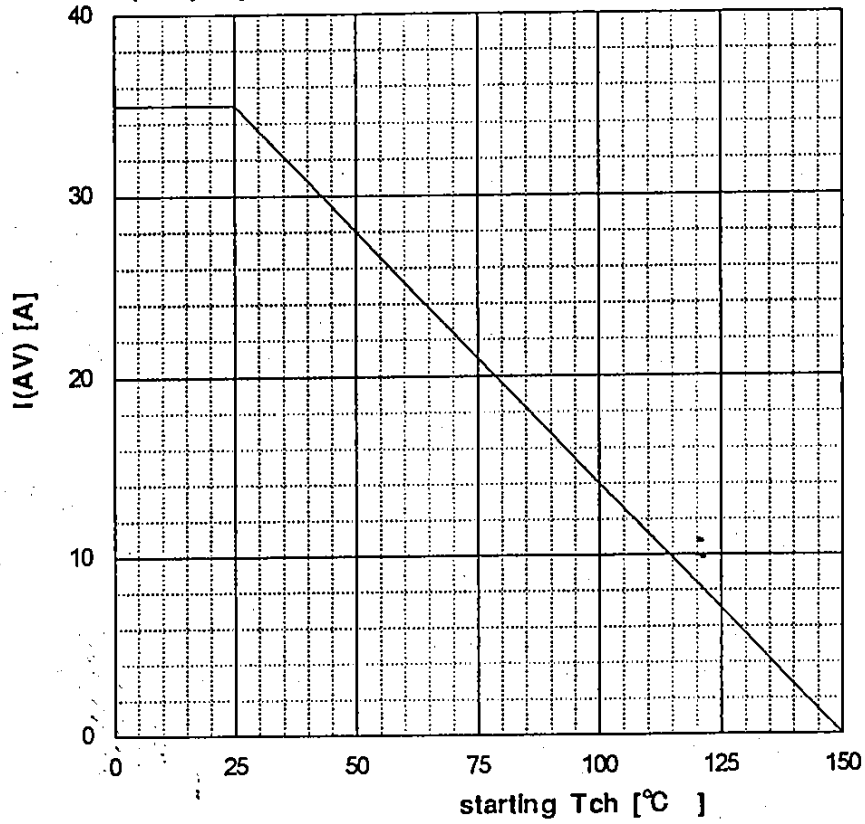
Typical Forward Characteristics of Reverse Diode  
 $I_F=f(V_{SD}): 80\mu\text{s pulse test, } T_{ch}=25^\circ\text{C}$



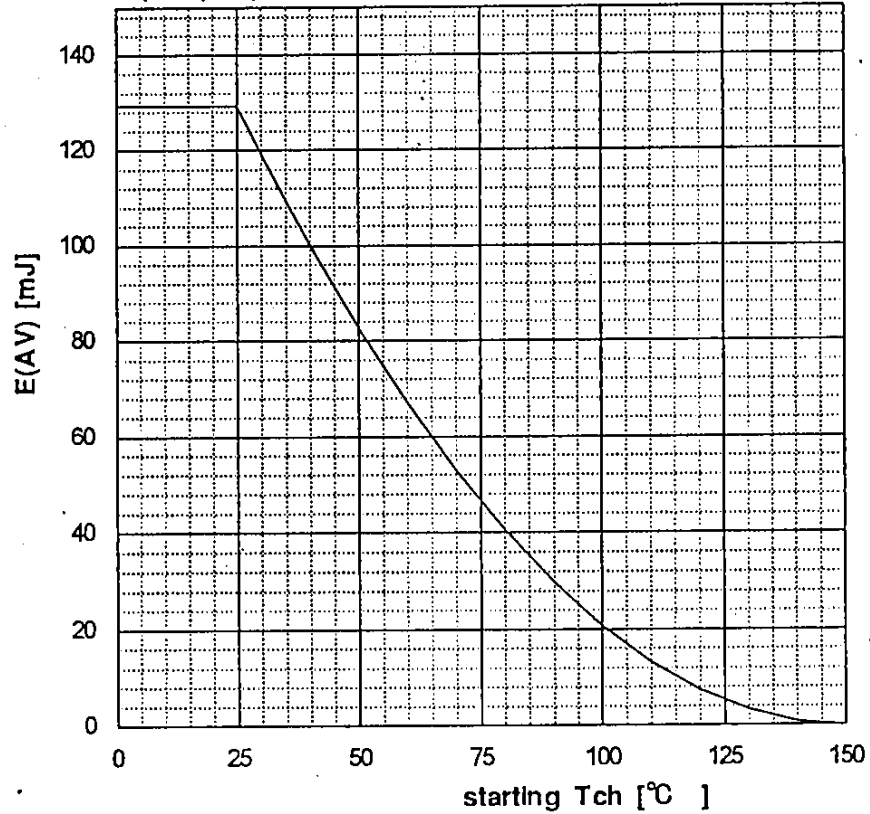
Typical Switching Characteristics vs.  $I_D$   
 $t=f(I_D): V_{cc}=15\text{V}, V_{GS}=10\text{V}, R_G=10\Omega$



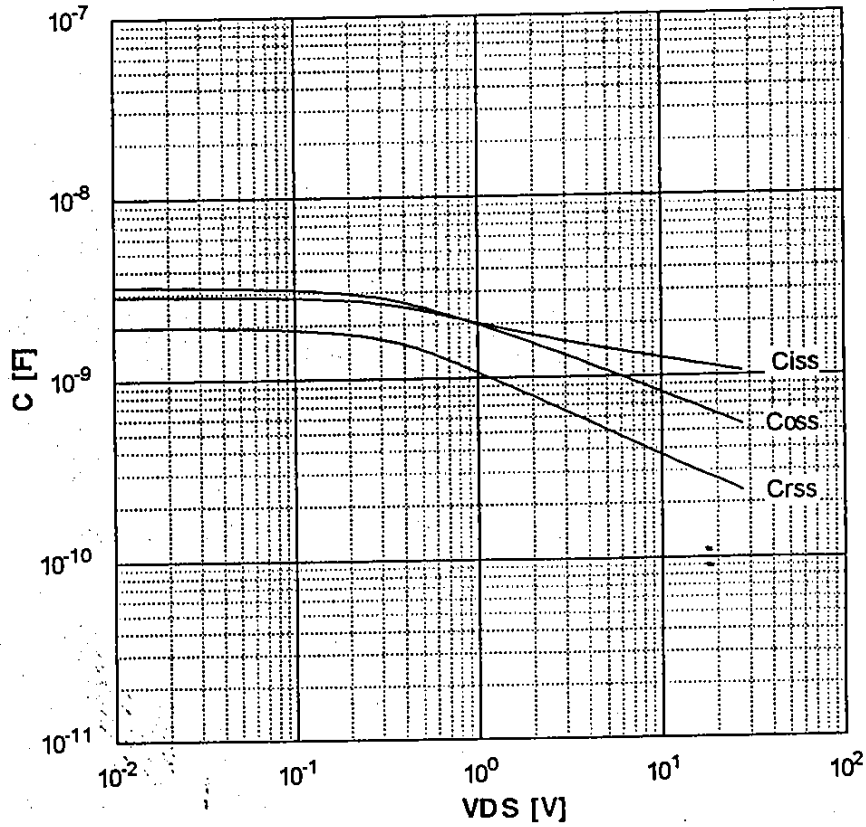
**Maximum Avalanche Current vs. starting T<sub>ch</sub>**  
 $I(AV)=f(\text{starting } T_{ch})$



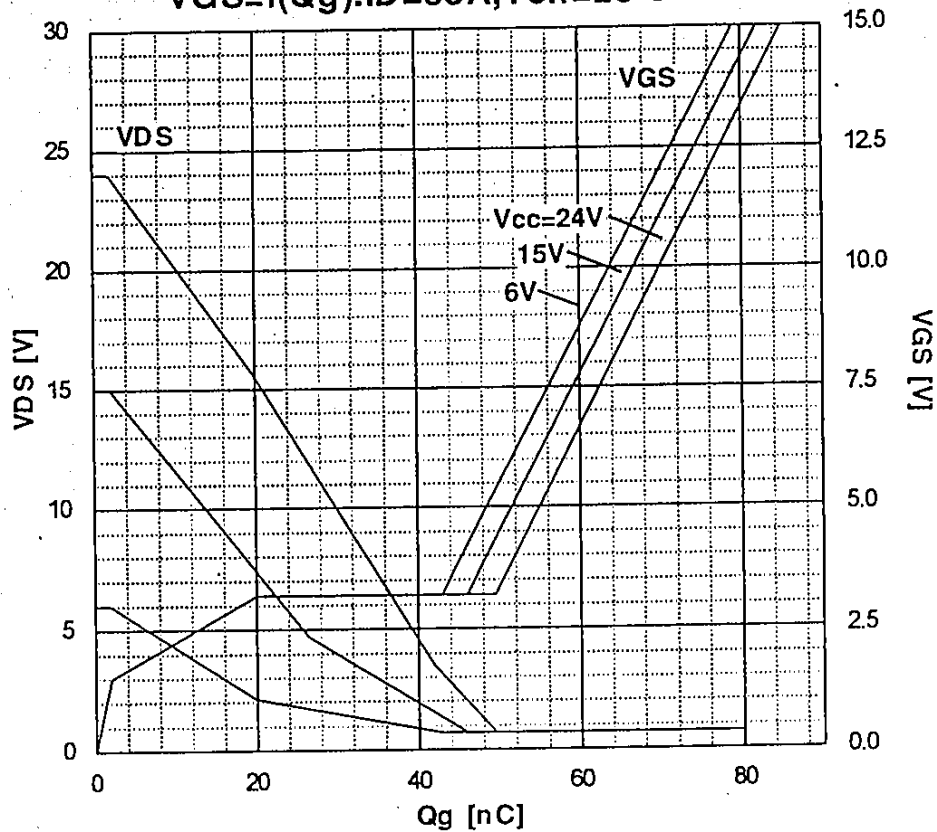
**Maximum Avalanche Energy vs. starting T<sub>ch</sub>**  
 $E(AV)=f(\text{starting } T_{ch}): V_{cc}=12V, I(AV) \leq 35A$



Typical Capacitances vs. VDS  
 $C=f(VDS): VGS=0V, f=1MHz$



Typical Gate Charge Characteristics  
 $VGS=f(Qg): I_D=35A, T_{ch}=25^\circ C$



# Transient Thermal Impedance

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

