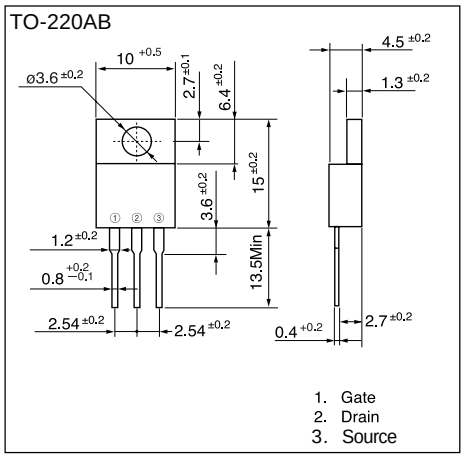
2SK3218-01

FUJI POWER MOS-FET

N-CHANNEL SILICON POWER MOS-FET

■ Features

High speed switching
Low on-resistance
No secondary breadown
Low driving power
Avalanche-proof



■ Applications

Switching regulators
UPS (Uninterruptible Power Supply)
DC-DC converters

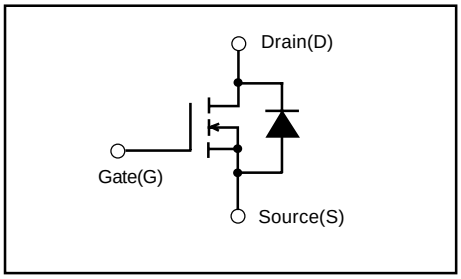
■ Maximum ratings and characteristic Absolute maximum ratings

● **(Tc=25°C unless otherwise specified)**

Item		Symbol	Rating	Unit
Drain-source voltage		V_{DS}	150	V
Continuous drain current		I_D	±40	A
Pulsed drain current		$I_{D(puls)}$	±160	A
Gate-source voltage		V_{GS}	±30	V
Maximum Avalanche Energy		E_{AV}*1	387	mJ
Max. power dissipation	Ta=25°C	P_D	1.67	W
	Tc=25°C	P_D	135	W
Operating and storage temperature range		T_{ch}	+150	℃
		T_{stg}	-55 to +150	℃

*1 L=420μH, Vcc=24V

■ Equivalent circuit schematic



● **Electrical characteristics (T_C =25°C unless otherwise specified)**

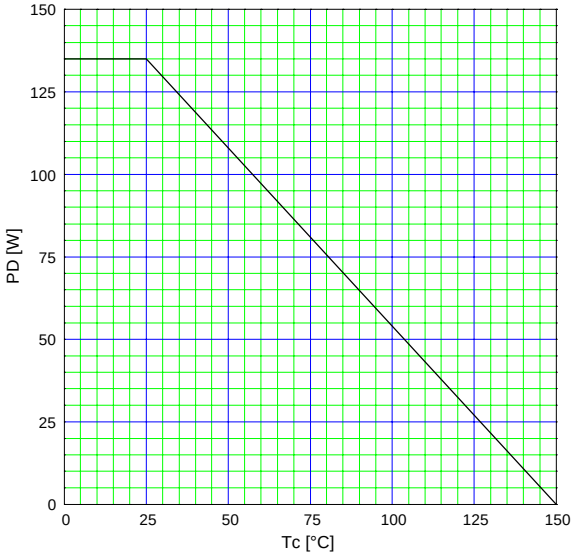
Item	Symbol	Test Conditions		Min.	Typ.	Max.	Units
Drain-source breakdown voltaget	$V_{(BR)DSS}$	I_D=1mA V_{GS}=0V		150			V
Gate threshold voltage	$V_{GS(th)}$	I_D=1mA V_{DS}=V_{GS}		2.5	3.0	3.5	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=150V	Tch=25°C		1	100	μA
		V_{GS}=0V	Tch=125°C		0.1	0.5	mA
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=20A V_{GS}=10V			37	43	mΩ
Forward transcondutance	g_{fs}	I_D=20A V_{DS}=25V		12.5	25.0		S
Input capacitance	C_{iss}	V_{DS}=25V			2650	3980	pF
Output capacitance	C_{oss}	V_{GS}=0V			550	830	
Reverse transfer capacitance	C_{rss}	f=1MHz			240	360	
Turn-on time t_{on}	$t_{d(on)}$	V_{CC}=48V I_D=40A			21	32	ns
	t_r	V_{GS}=10V			95	142	
Turn-off time t_{off}	$t_{d(off)}$	R_{GS}=10Ω			115	173	
	t_f				60	90	
Avalanche capability	I_{AV}	L=100μH Tch=25°C		40			A
Diode forward on-voltage	V_{SD}	I_F=40A V_{GS}=0V Tch=25°C			0.97	1.46	V
Reverse recovery time	t_{rr}	I_F=40A V_{GS}=0V			180		ns
Reverse recovery charge	Q_{rr}	-di/dt=100A/μs Tch=25°C			1.30		μC

● **Thermalcharacteristics**

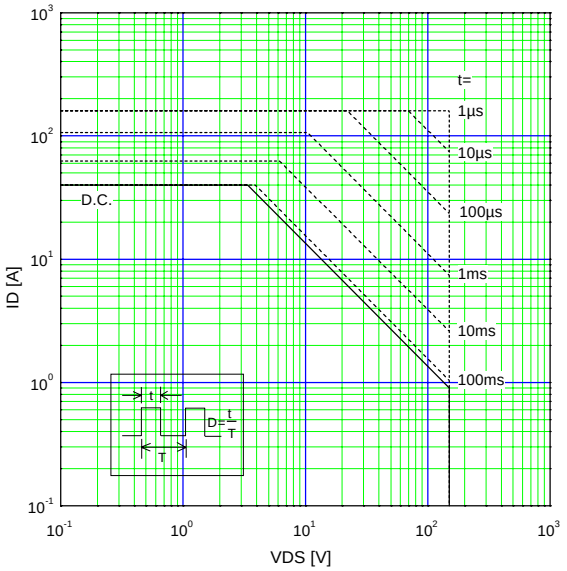
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-c)}$	channel to case			0.93	°C/W
	$R_{th(ch-a)}$	channel to ambient			75.0	°C/W

Characteristics

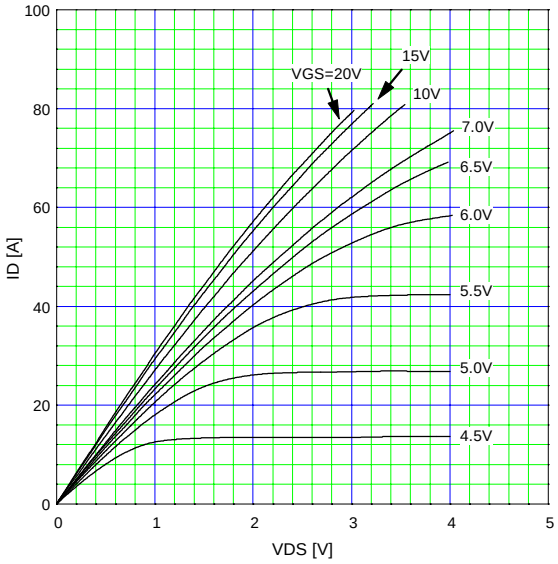
Power Dissipation
PD=f(Tc)



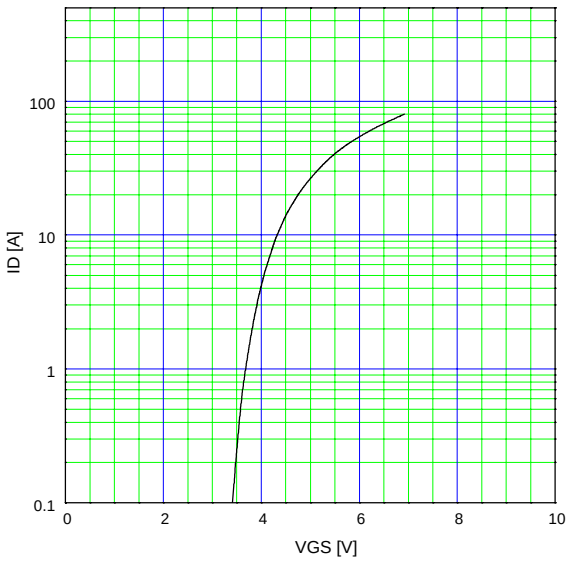
Safe operating area
ID=f(VDS):Single Pulse(D=0),Tc=25°C



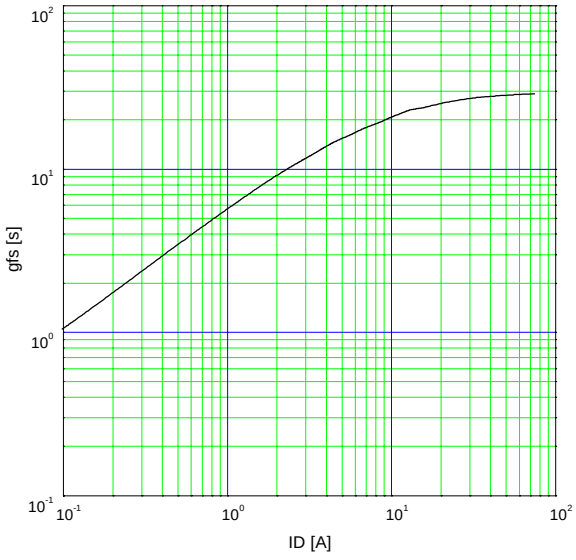
Typical output characteristics
ID=f(VDS):80µs pulse test,Tc=25°C



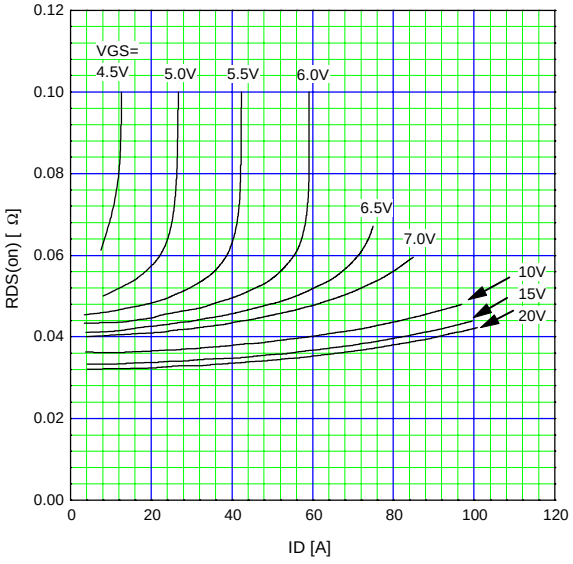
Typical transfer characteristics
ID=f(VGS):80µs pulse test,VDS=25V,Tch=25°C



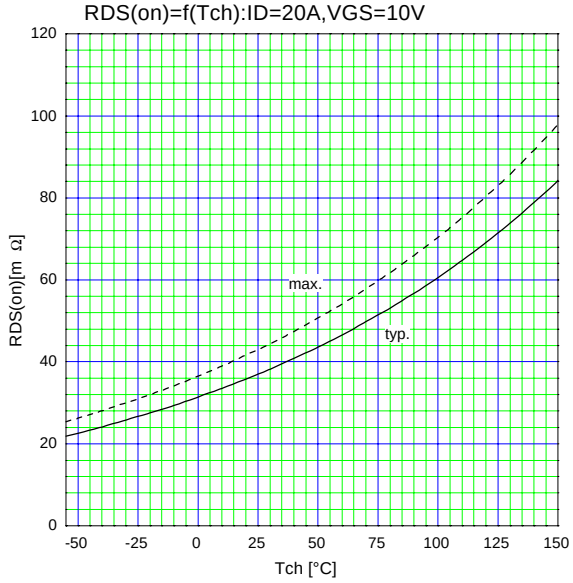
Typical forward transconductance
gfs=f(ID):80µs pulse test,VDS=25V,Tch=25°C



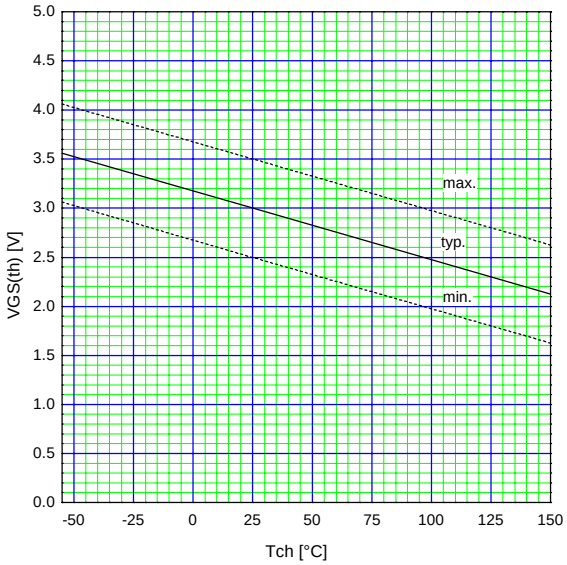
Typical Drain-Source on-State Resistance
RDS(on)=f(ID):80µs pulse test,Tch=25°C



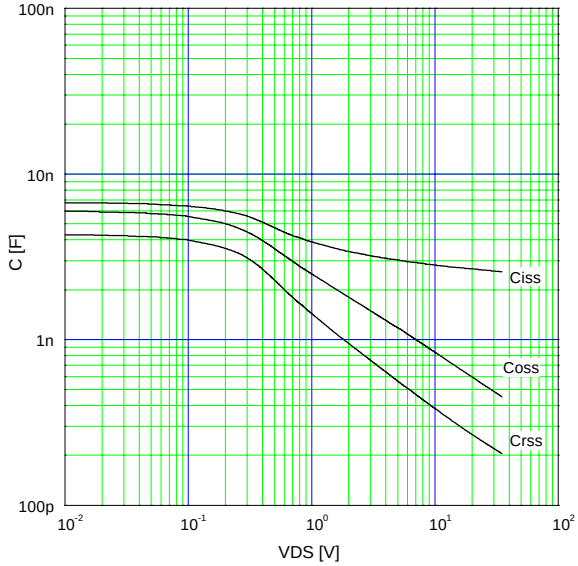
Drain-source on-state resistance
RDS(on)=f(Tch):ID=20A,VGS=10V



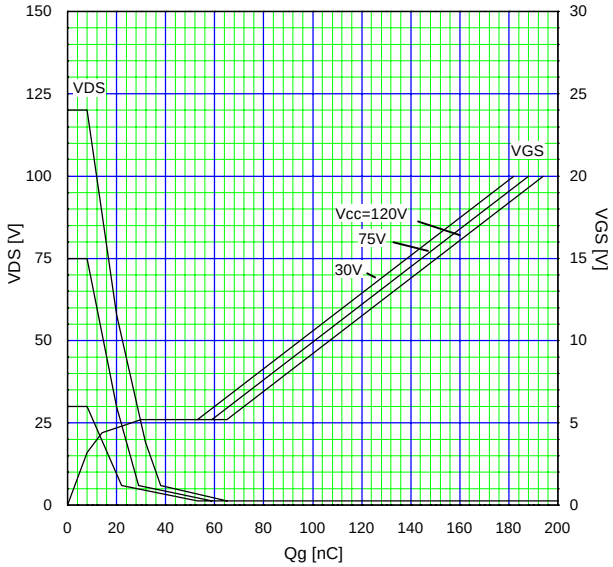
Gate Threshold Voltage vs. Tch
VGS(th)=f(Tch):VDS=VGS,ID=1mA



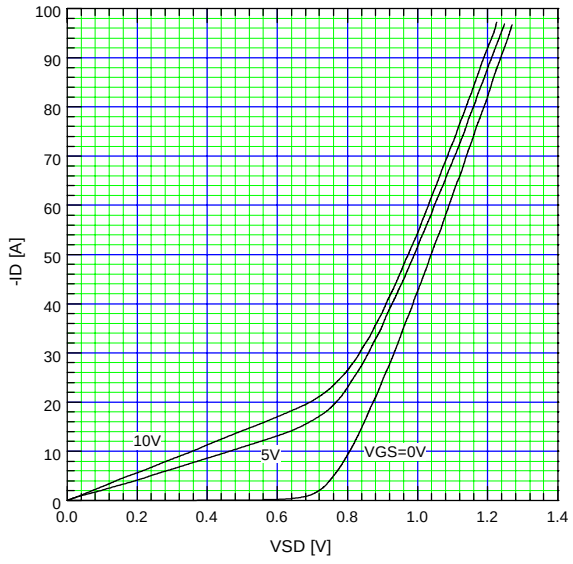
Typical capacitances
C=f(VDS):VGS=0V,f=1MHz



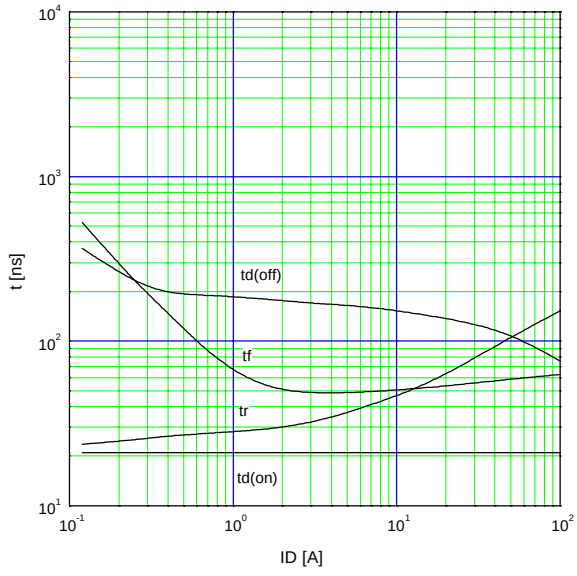
Typical Gate Charge Characteristics
VGS=f(Qg):ID=40A,Tch=25°C



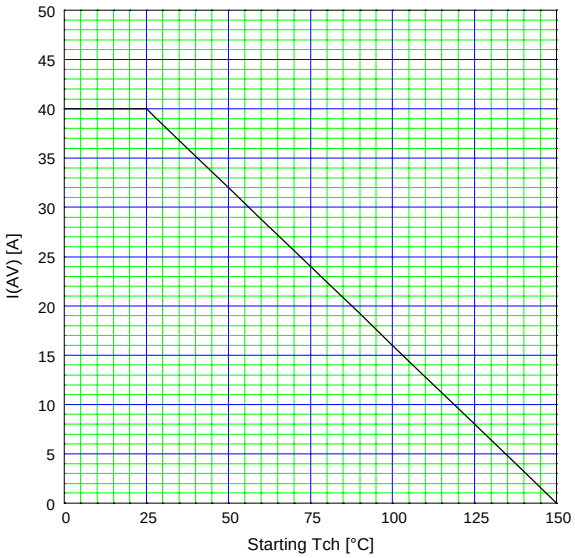
Typical Forward Characteristics of Reverse Diode
-ID=f(VSD):80µs pulse test,Tch=25°C



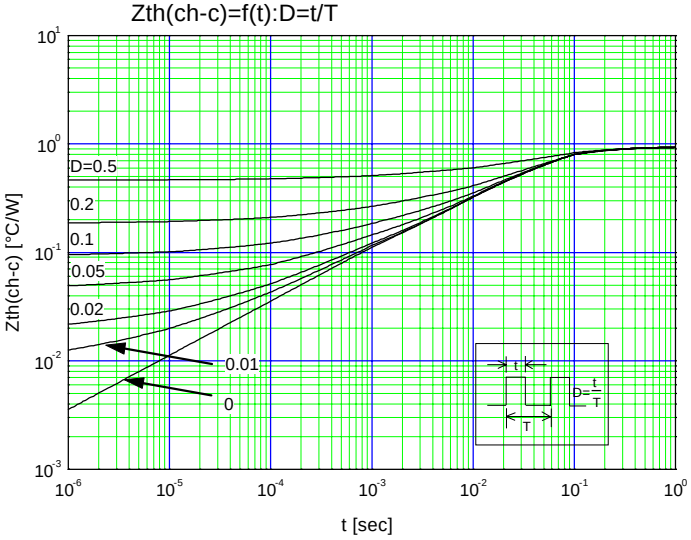
Typical Switching Characteristics vs. ID
t=f(ID):Vcc=48V,VGS=10V,RG=10 Ω



Maximum Avalanche Current vs. starting Tch
I(AV)=f(starting Tch),Non Repetitive



Transient Thermal Impedance
Zth(ch-c)=f(t):D=t/T



Maximum Avalanche energy vs. starting Tch
Eas=f(starting Tch):Vcc=24V,I_{AV}<=40A,Non-Repetitive