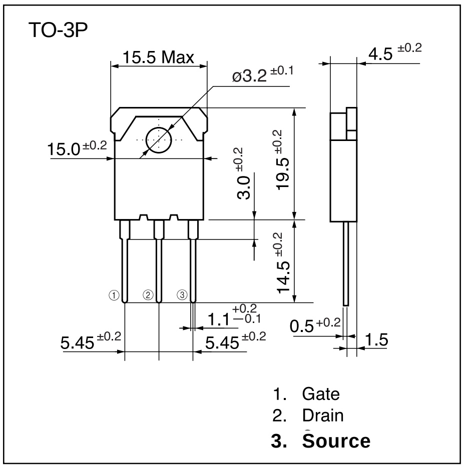
2SK2904-01

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

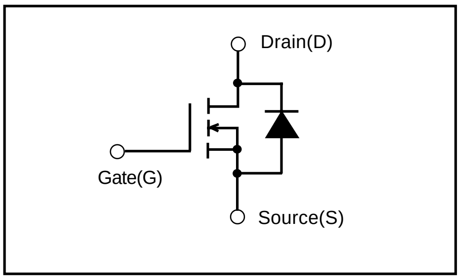
■ Maximum ratings and characteristic**Absolute maximum ratings**

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

Item	Symbol	Rating	Unit
Drain-source voltage	V_{DS}	60	V
Continuous drain current	I_D	±80	A
Pulsed drain current	$I_{D(puls]}$	±320	A
Gate-source voltage	V_{GS}	±30	V
Maximum Avalanche Energy	E_{AV}*1	972.3	mJ
Max. power dissipation	P_D	125	W
Operating and storage	T_{ch}	+150	℃
temperature range	T_{stg}	-55 to +150	℃

*1 L=0.203mH, 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	BV_{DSS}	I_D=1mA V_{GS}=0V		60			V
Gate threshold voltage	$V_{GS(th)}$	I_D=10mA V_{DS}=V_{GS}		2.5	3.0	3.5	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=60V	T_{ch}=25°C		10	500	µA
		V_{GS}=0V	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=40A V_{GS}=10V			9.5	12	mΩ
Forward transcondutance	g_{fs}	I_D=40A V_{DS}=25V		20	40		S
Input capacitance	C_{iss}	V_{DS}=25V			3100	4650	pF
Output capacitance	C_{oss}	V_{GS}=0V			1300	1950	
Reverse transfer capacitance	C_{rss}	f=1MHz			350	530	
Turn-on time t_{on}	$t_{d(on)}$	V_{CC}=30V I_D=80A			20	30	ns
	t_r	V_{GS}=10V			85	120	
Turn-off time t_{off}	$t_{d(off)}$	R_{GS}=10 Ω			88	130	
	t_f				65	120	
Avalanche capability	I_{AV}	L=100 µH T_{ch}=25°C		80			A
Diode forward on-voltage	V_{SD}	I_F=50A V_{GS}=0V T_{ch}=25°C			1.0	1.5	V
Reverse recovery time	t_{rr}	I_F=50A V_{GS}=0V			70		ns
Reverse recovery charge	Q_{rr}	-di/dt=100A/µs T_{ch}=25°C			0.13		µC

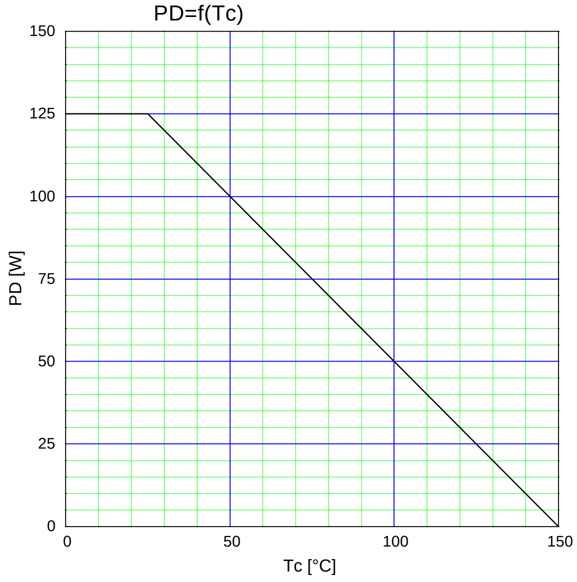
● **Thermalcharacteristics**

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-c)}$	channel to case			1.0	°C/W
	$R_{th(ch-a)}$	channel to ambient			35.0	°C/W

Characteristics

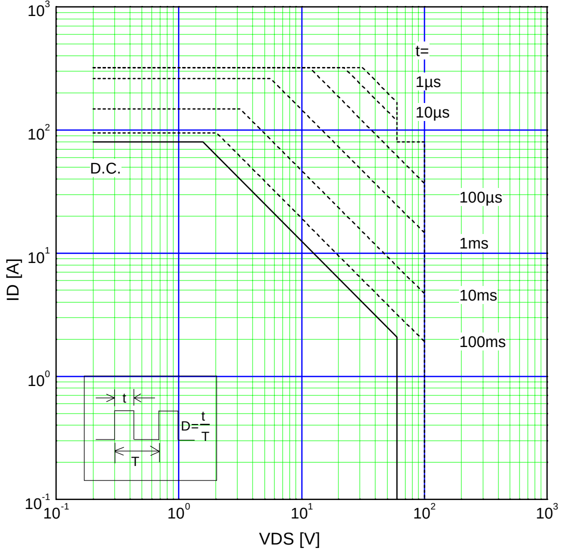
Power Dissipation

PD=f(Tc)



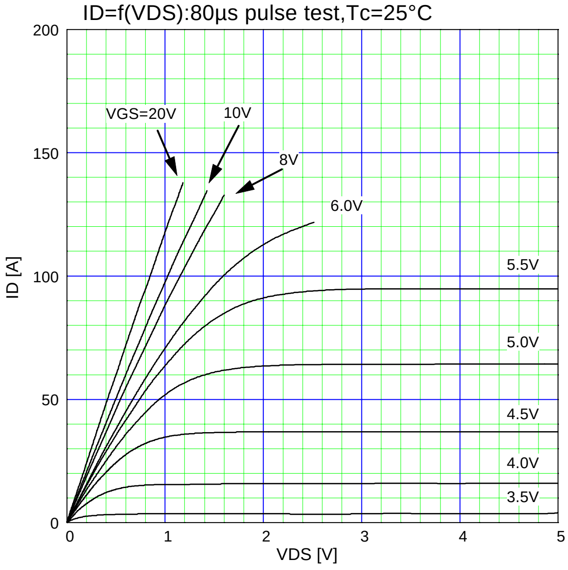
Safe operating area

ID=f(VDS):D=0.01,Tc=25°C



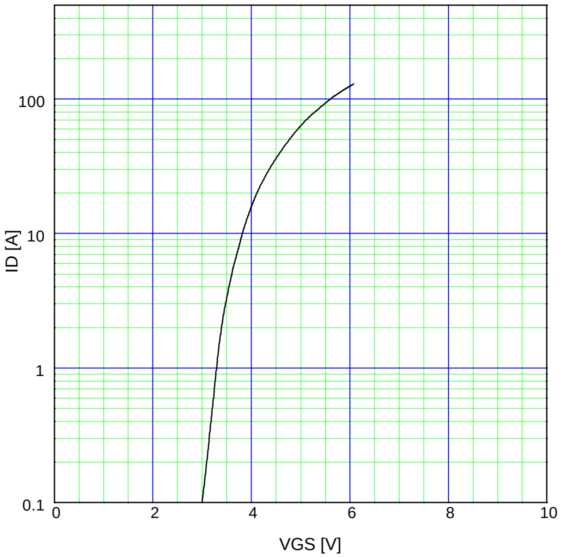
Typical output characteristics

ID=f(VDS):80µs pulse test,Tc=25°C



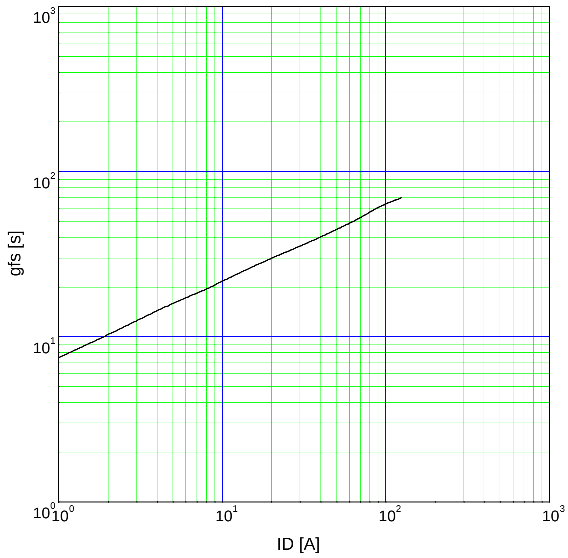
Typical transfer characteristics

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



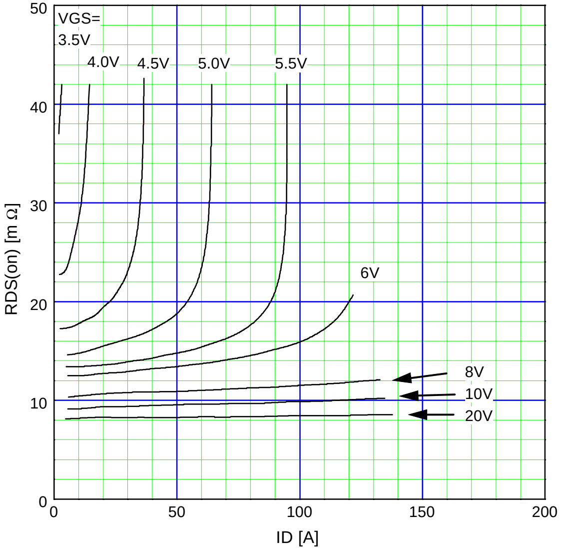
Typical forward transconductance

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

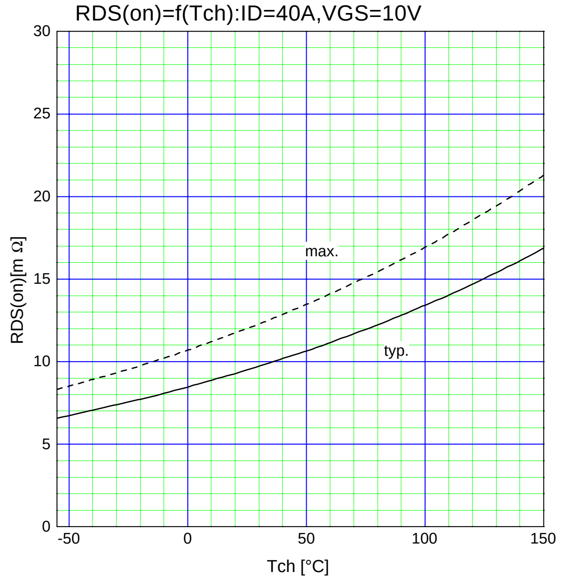


Typical Drain-Source on-State Resistance

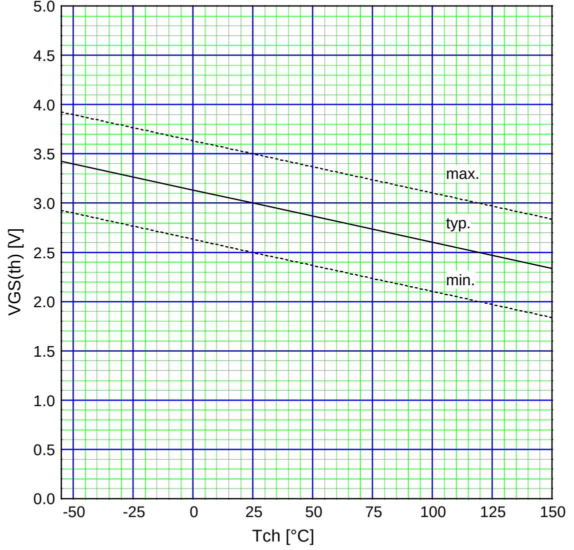
RDS(on)=f(ID):80µs pulse test,Tch=25°C



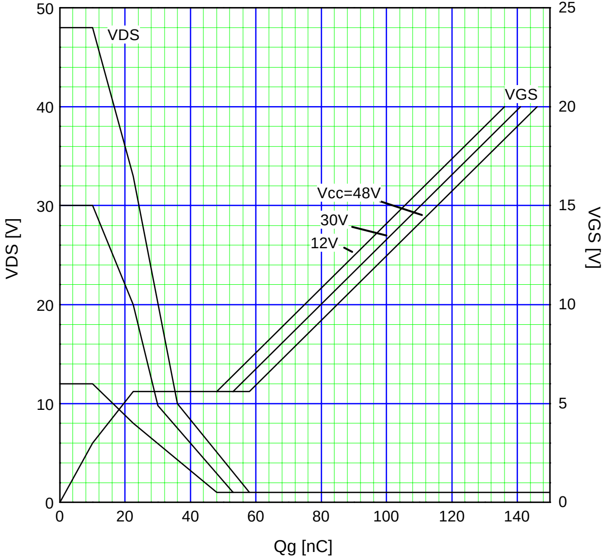
Drain-source on-state resistance
RDS(on)=f(Tch):ID=40A,VGS=10V



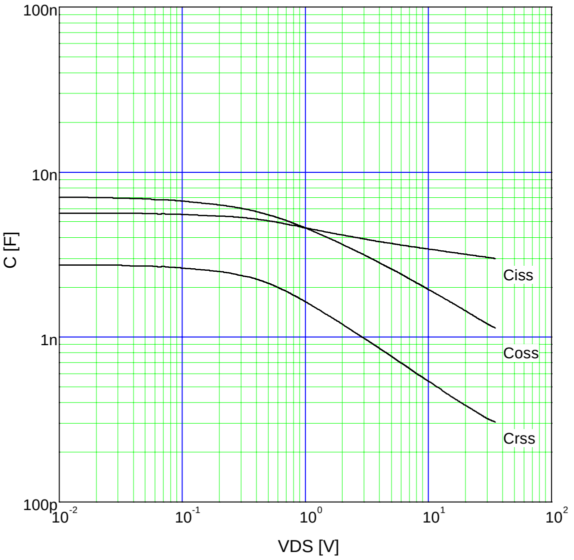
Gate Threshold Voltage vs. Tch
VGS(th)=f(Tch):VDS=VGS,ID=10mA



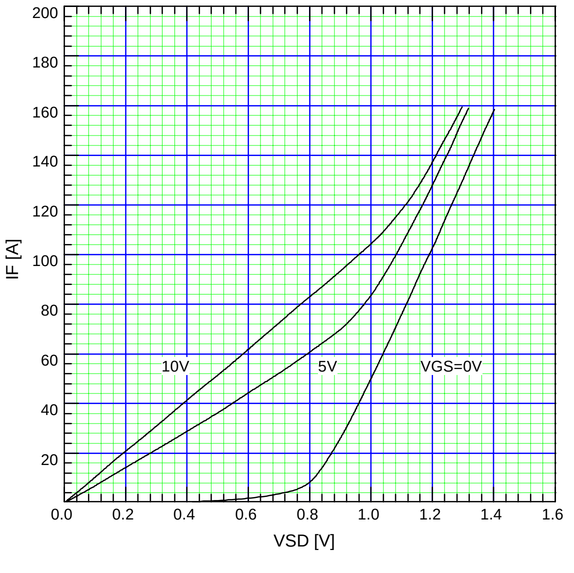
Typical Gate Charge Characteristics
VGS=f(Qg):ID=80A,Tch=25°C



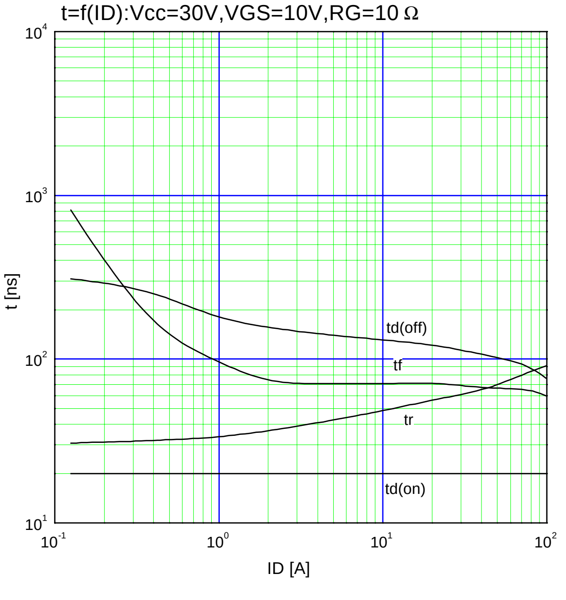
Typical capacitances
C=f(VDS):VGS=0V,f=1MHz

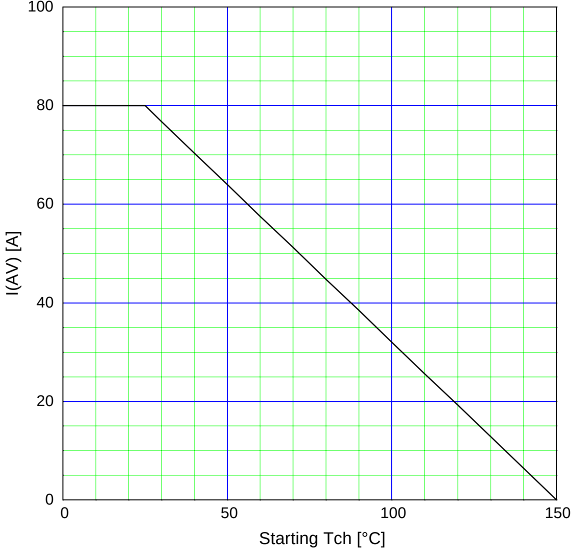


Typical Forward Characteristics of Reverse Diode
IF=f(VSD):80µs pulse test,Tch=25°C

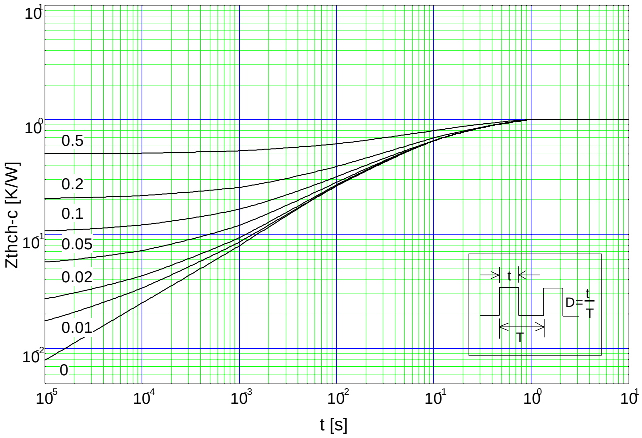


Typical Switching Characteristics vs. ID
t=f(ID):Vcc=30V,VGS=10V,RG=10 Ω

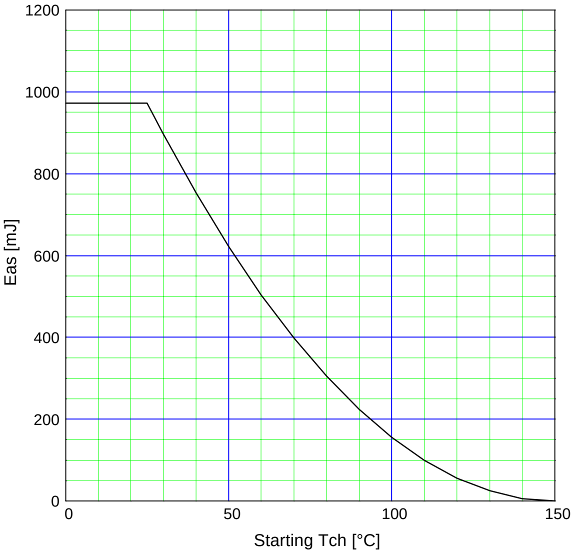




Maximum Avalanche Current vs. starting Tch
I(AV)=f(starting Tch)



Transient thermal impedande
Zthch=f(t) parameter:D=t/T



Maximum Avalanche energy vs. starting Tch
Eas=f(starting Tch):Vcc=24V, I(AV)<=80A