2SK3682-01

200309

FUJI POWER MOSFET
Super FAP-G Series

N-CHANNEL SILICON POWER MOSFET

■ Features

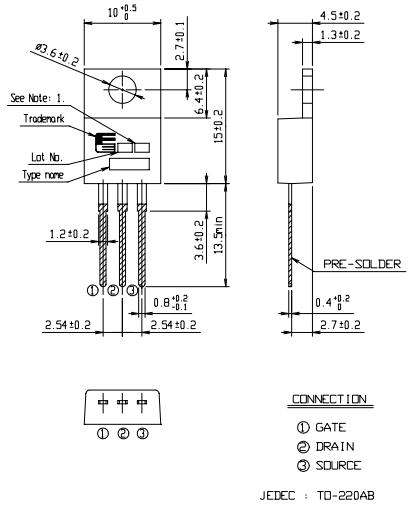
- High speed switching
- Low on-resistance
- No secondary breadown
- Low driving power
- Avalanche-proof

■ Applications

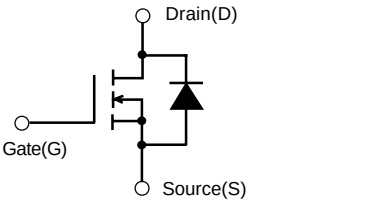
- Switching regulators
- DC-DC converters
- UPS (Uninterruptible Power Supply)

■ Outline Drawings [mm]

TO-220AB



■ Equivalent circuit schematic



■ Maximum ratings and characteristic Absolute maximum ratings

● (Tc=25°C unless otherwise specified)

Item	Symbol	Ratings	Unit	Remarks
Drain-source voltage	V_{DS}	500	V	
	V_{DSX}	500	V	V_{GS}=-30V
Continuous drain current	I_D	±19	A	
Pulsed drain current	$I_{D(puls)}$	±76	A	
Gate-source voltage	V_{GS}	±30	V	
Non-Repetitive Maximum avalanche current	I_{AS}	19	A	Tch≦150°C
Non-Repetitive Maximum avalanche energy	E_{AS}	245.3	mJ	L=1.25mH V_{CC}=50V *2
Maximum Drain-Source dV/dt	dV_{DS}/dt	20	kV/s	VDS≦500V
Peak diode recovery dV/dt	dV/dt	5	kV/μs	*3
Max. power dissipation	P_D	2.02	W	Ta=25°C
		270		Tc=25°C
Operating and storage temperature range	T_{ch}	+150	°C	
	T_{stg}	-55 to +150	°C	

*2 See to Avalanche Energy Graph
*3 I_F≦ -I_D, -di/dt=50A/μs, V_{CC}≦ BV_{DSS}, Tch≦150°C

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

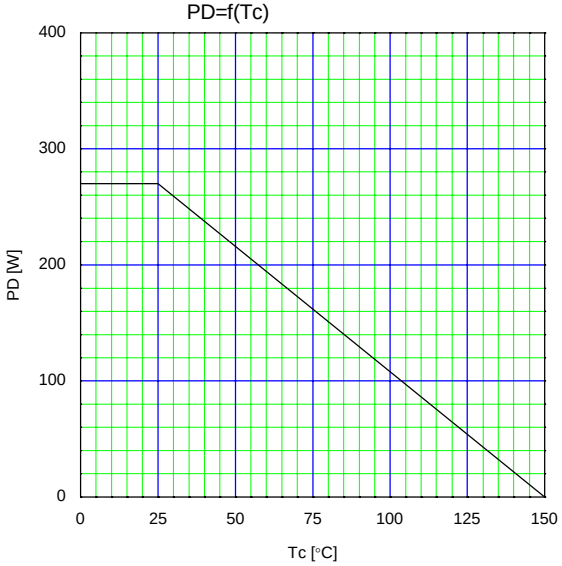
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltaget	$V_{(BR)DSS}$	I_D= 250μA V_{GS}=0V	500			V
Gate threshold voltage	$V_{GS(th)}$	I_D= 250μA V_{DS}=V_{GS}	3.0		5.0	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=500V V_{GS}=0V Tch=25°C			25	μA
		V_{DS}=400V V_{GS}=0V Tch=125°C			250	
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=9.5A V_{GS}=10V		0.29	0.38	Ω
Forward transcondutance	g_{fs}	I_D=9.5A V_{DS}=25V	7.5	15		S
Input capacitance	C_{iss}	V_{DS}=25V		1560	2340	pF
Output capacitance	C_{oss}	V_{GS}=0V		230	345	
Reverse transfer capacitance	C_{rss}	f=1MHz		8	12	
Turn-on time t_{on}	$t_{d(on)}$	V_{CC}=300V I_D=9.5A		29	43.5	ns
	t_r	V_{GS}=10V		13	19.5	
Turn-off time t_{off}	$t_{d(off)}$	R_{GS}=10 Ω		56	84	
	t_f			8	12	
Total Gate Charge	Q_G	V_{CC}=250V		34	51	nC
Gate-Source Charge	Q_{GS}	I_D=19A		13	19.5	
Gate-Drain Charge	Q_{GD}	V_{GS}=10V		10	15	
Avalanche capability	I_{AV}	L=1.25mH Tch=25°C	19			A
Diode forward on-voltage	V_{SD}	I_F=19A V_{GS}=0V Tch=25°C		1.20	1.50	V
Reverse recovery time	t_{rr}	I_F=19A V_{GS}=0V		0.57		μs
Reverse recovery charge	Q_{rr}	-di/dt=100A/μs Tch=25°C		7.0		μC

● Thermalcharacteristics

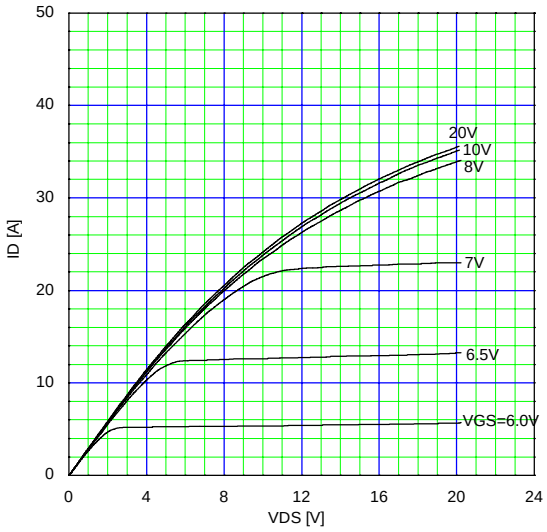
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-c)}$	channel to case			0.463	°C/W
	$R_{th(ch-a)}$	channel to ambient			62.0	°C/W

Characteristics

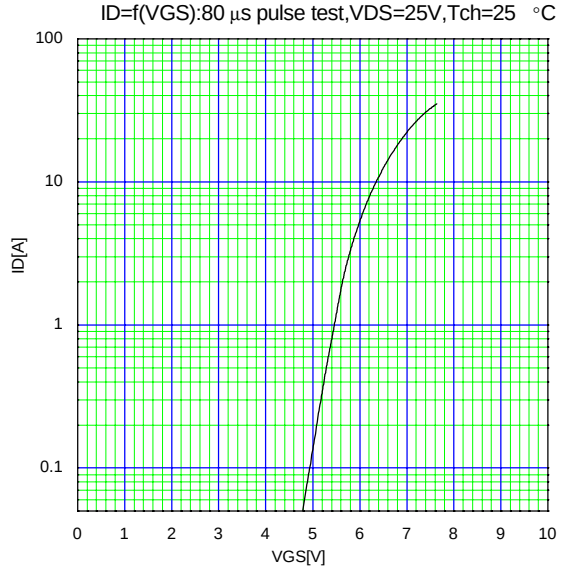
Allowable Power Dissipation
PD=f(Tc)



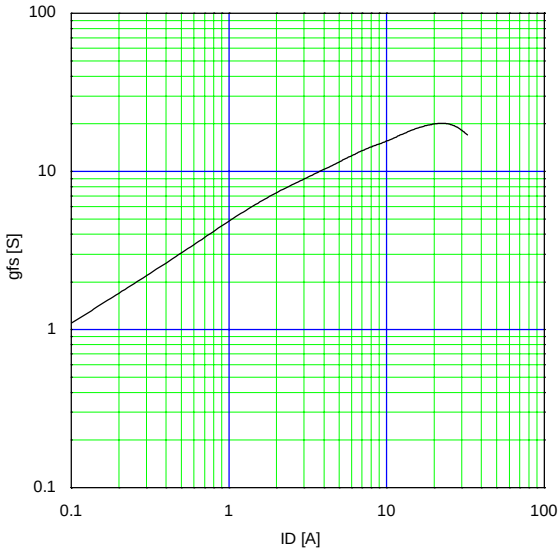
Typical Output Characteristics
ID=f(VDS):80 μs pulse test,Tch=25 °C



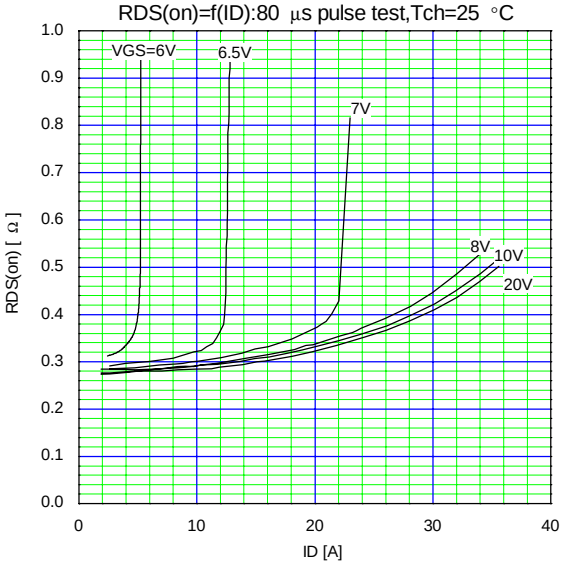
Typical Transfer Characteristic
ID=f(VGS):80 μs pulse test,VDS=25V,Tch=25 °C



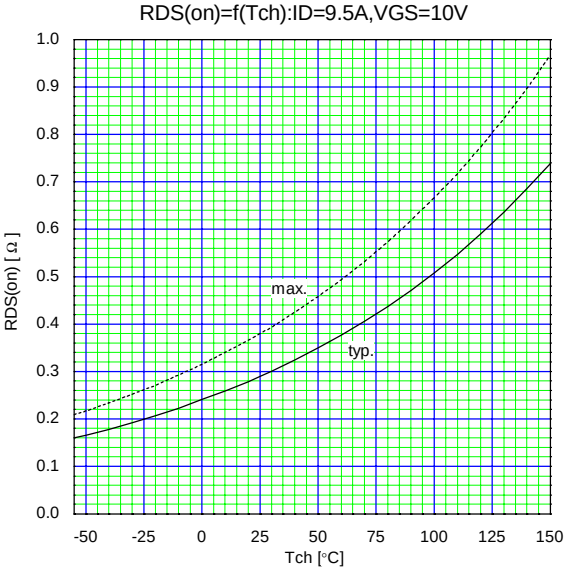
Typical Transconductance
gfs=f(ID):80 μs pulse test,VDS=25V,Tch=25 °C



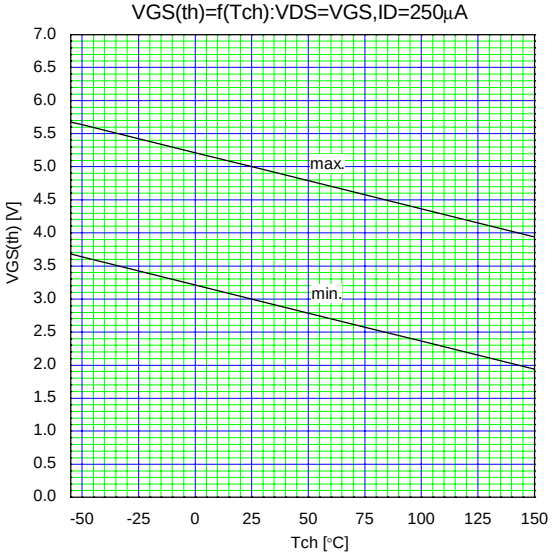
Typical Drain-Source on-state Resistance
RDS(on)=f(ID):80 μs pulse test,Tch=25 °C



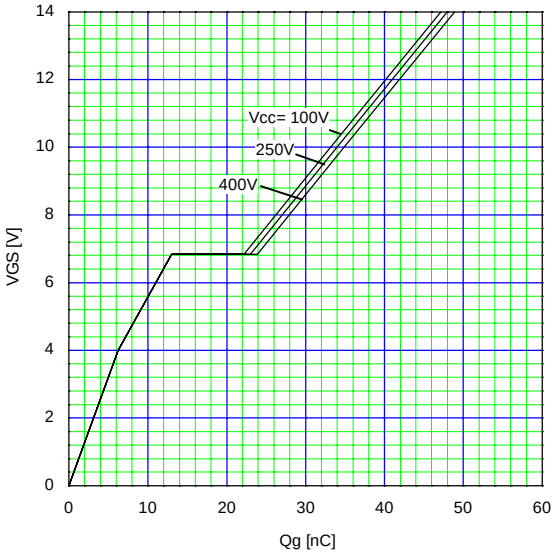
Drain-Source On-state Resistance
RDS(on)=f(Tch):ID=9.5A,VGS=10V



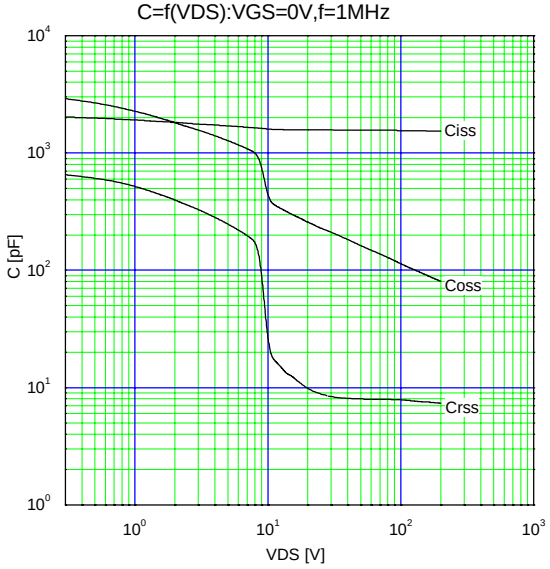
Gate Threshold Voltage vs. Tch
VGS(th)=f(Tch):VDS=VGS,ID=250μA



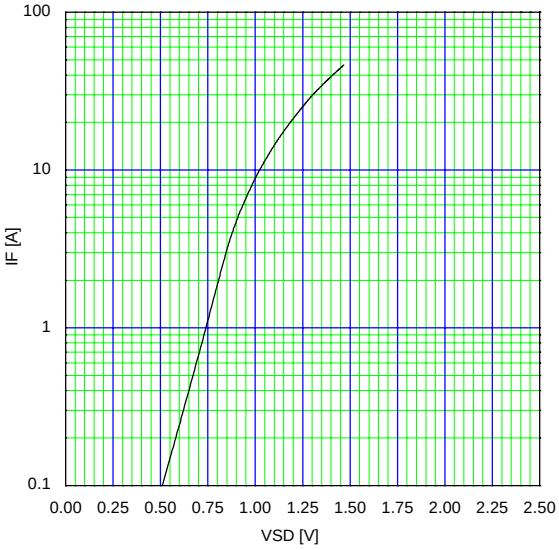
Typical Gate Charge Characteristics
VGS=f(Qg):ID=19A,Tch=25 °C



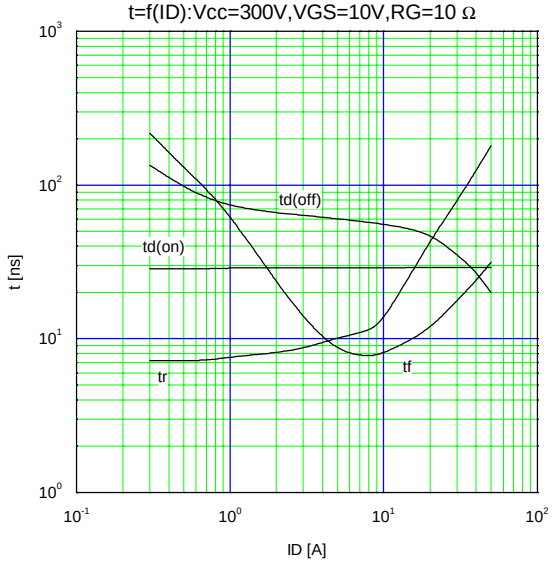
Typical Capacitance
C=f(VDS):VGS=0V,f=1MHz



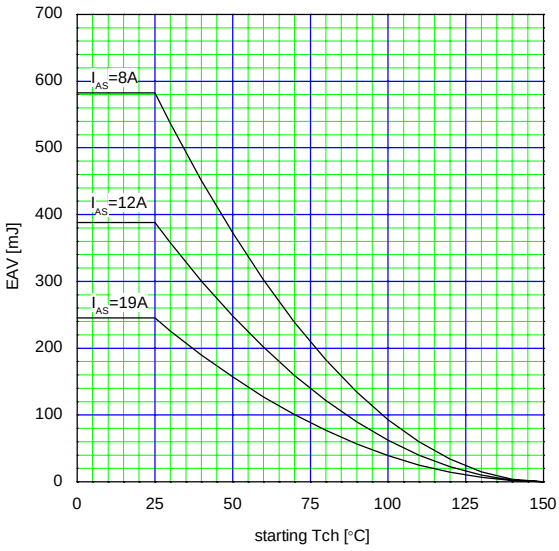
Typical Forward Characteristics of Reverse Diode
IF=f(VSD):80 μs pulse test,Tch=25 °C



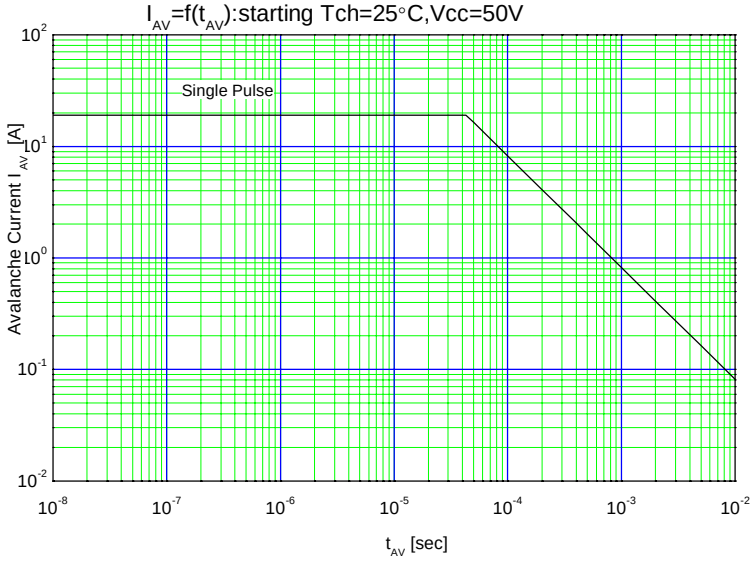
Typical Switching Characteristics vs. ID
t=f(ID):Vcc=300V,VGS=10V,RG=10 Ω



Maximum Avalanche Energy vs. starting Tch
E(AV)=f(starting Tch):Vcc=50V,I(AV)<=19A



Maximum Avalanche Current Pulsewidth
I_{AV}=f(t_{AV}):starting Tch=25°C,Vcc=50V



Maximum Transient Thermal Impedance
Zth(ch-c)=f(t):D=0

