2SK3595-01MR

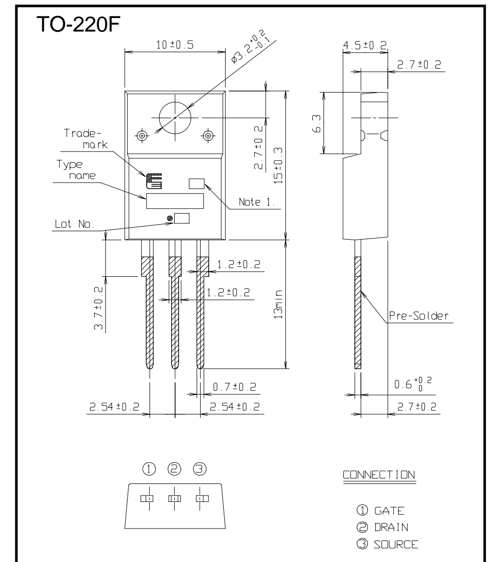
FUJI ELECTRIC

200304

FUJI POWER MOSFET
Super FAP-G Series

N-CHANNEL SILICON POWER MOSFET

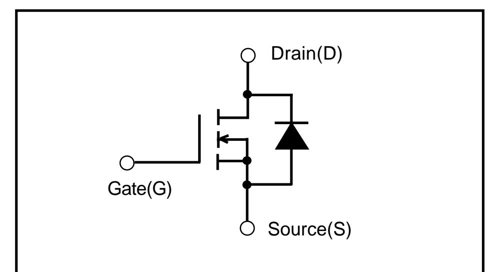
■ Outline Drawings (mm)



■ 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

■ Equivalent circuit schematic



■ Maximum ratings and characteristic Absolute maximum ratings

● (Tc=25°C unless otherwise specified)

Item	Symbol		Ratings	Unit
Drain-source voltage	V_{DS}		200	V
	V_{DSX} *5		170	V
Continuous drain current	I_D		±45	A
Pulsed drain current	$I_{D(puls)}$		±180	A
Gate-source voltage	V_{GS}		±30	V
Non-repetitive Avalanche current	I_{AS} *2		45	A
Maximum Avalanche Energy	E_{AS} *1		258.9	mJ
Maximum Drain-Source dV/dt	dV_{DS}/dt *4		20	kV/μs
Peak Diode Recovery dV/dt	dV/dt *3		5	kV/μs
Max. power dissipation	P_D	Ta=25°C	2.16	W
		Tc=25°C	95	
Operating and storage	T_{ch}		+150	°C
temperature range	T_{stg}		-55 to +150	°C
Isolation voltage	V_{ISO} *6		2	

*1 L=205μH, Vcc=48V,Tch=25°C, See to Avalanche Energy Graph *2 Tch ≦150°C
*3 $I_F \leqq -I_D$, -di/dt=50A/μs, $V_{CC} \leqq BV_{DSS}$, Tch ≦ 150°C *4 $V_{DS} \leqq$ 200V *5 V_{GS}=-30V *6 t=60sec f=60Hz

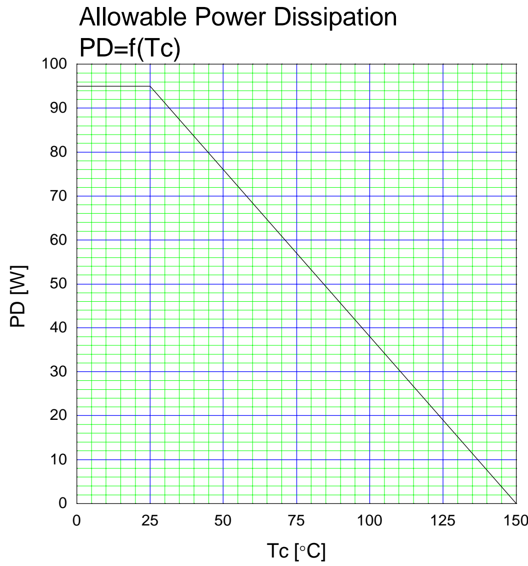
● **Electrical characteristics (Tc =25°C unless otherwise specified)**

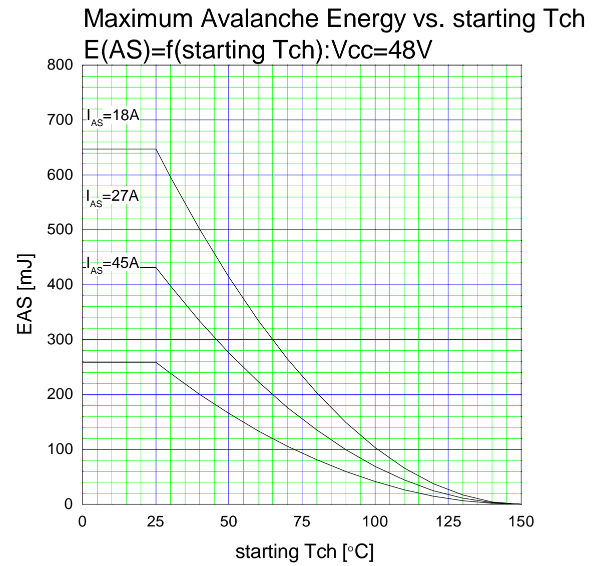
Item	Symbol	Test Conditions		Min.	Typ.	Max.	Units
Drain-source breakdown voltaget	$V_{(BR)DSS}$	I_D= 250μA V_{GS}=0V		200			V
Gate threshold voltage	$V_{GS(th)}$	I_D= 250μA $V_{DS}=V_{GS}$		3.0		5.0	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=200V V_{GS}=0V	T_{ch}=25°C			25	μA
		V_{DS}=160V V_{GS}=0V	T_{ch}=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=15A V_{GS}=10V			50	66	mΩ
Forward transcondutance	g_{fs}	I_D=15A V_{DS}=25V		12.5	25		S
Input capacitance	C_{iss}	V_{DS}=75V			1960	2940	pF
Output capacitance	C_{oss}	V_{GS}=0V			260	390	
Reverse transfer capacitance	C_{rss}	f=1MHz			18	27	
Turn-on time t_{on}	$t_{d(on)}$	V_{CC}=48V I_D=15A			20	30	ns
	t_r	V_{GS}=10V			17	26	
Turn-off time t_{off}	$t_{d(off)}$	R_{GS}=10 Ω			53	80	
	t_f				19	29	
Total Gate Charge	Q_G	V_{CC}=100V			51	76.5	nC
Gate-Source Charge	Q_{GS}	I_D=30A			15	22.5	
Gate-Drain Charge	Q_{GD}	V_{GS}=10V			16	24	
Avalanche capability	I_{AV}	L=205μH T_{ch}=25°C		45			A
Diode forward on-voltage	V_{SD}	I_F=30A V_{GS}=0V T_{ch}=25°C			1.10	1.65	V
Reverse recovery time	t_{rr}	I_F=30A V_{GS}=0V			0.19		μs
Reverse recovery charge	Q_{rr}	-di/dt=100A/μs T_{ch}=25°C			1.4		μC

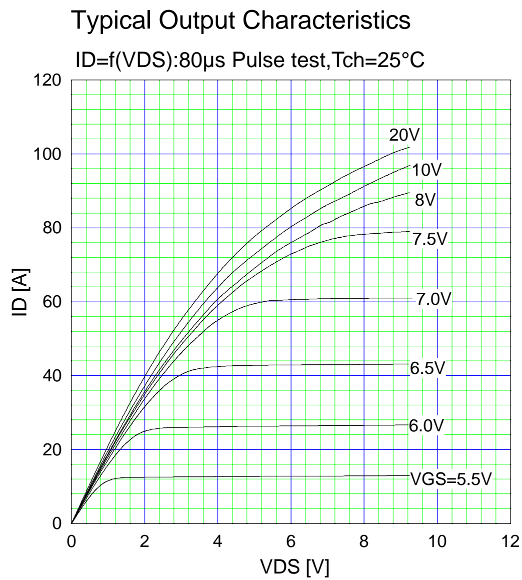
● **Thermalcharacteristics**

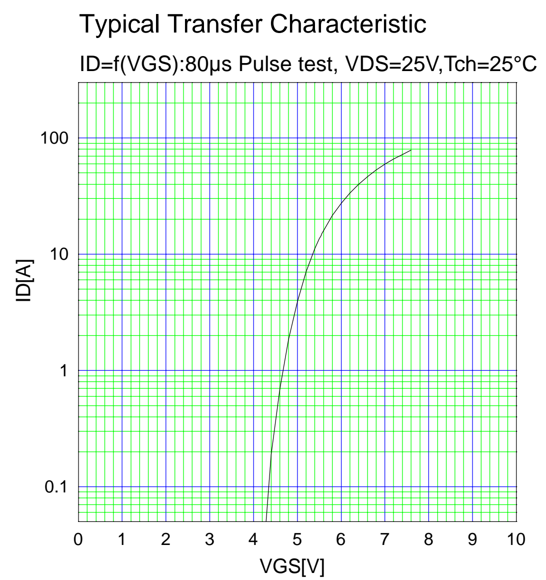
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-c)}$	channel to case			1.316	°C/W
	$R_{th(ch-a)}$	channel to ambient			58.0	°C/W

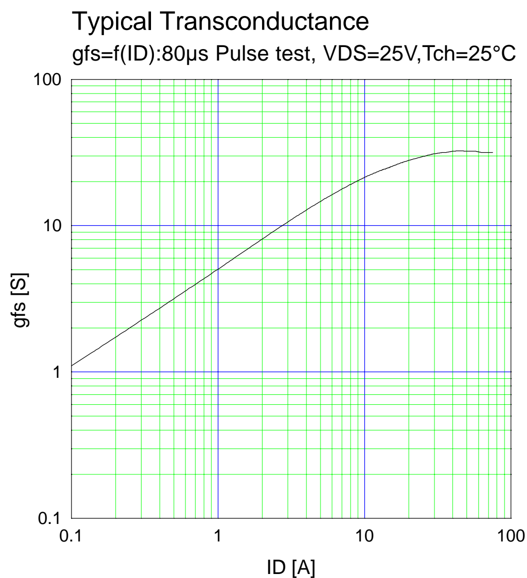
Characteristics

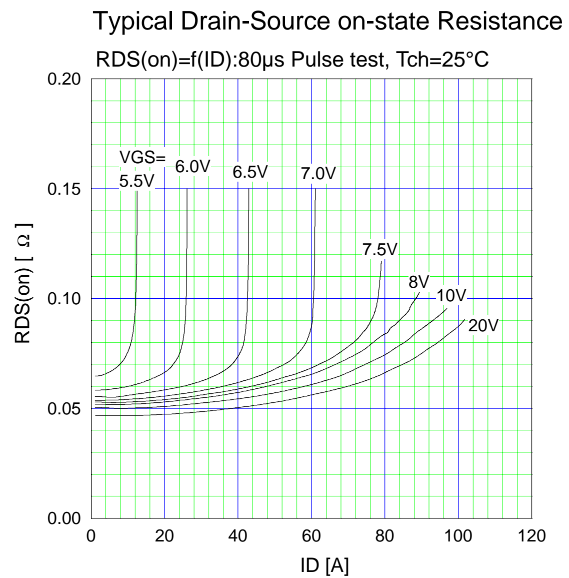




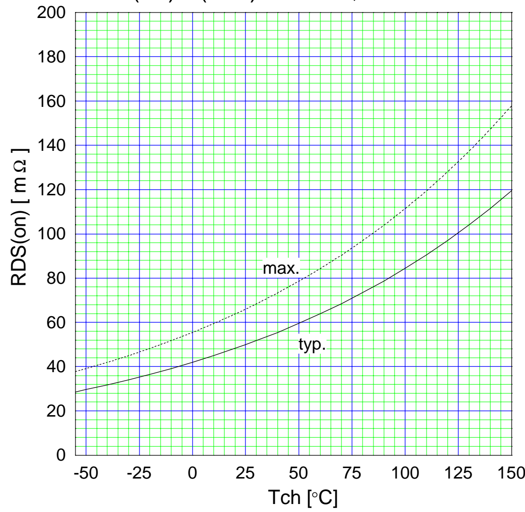




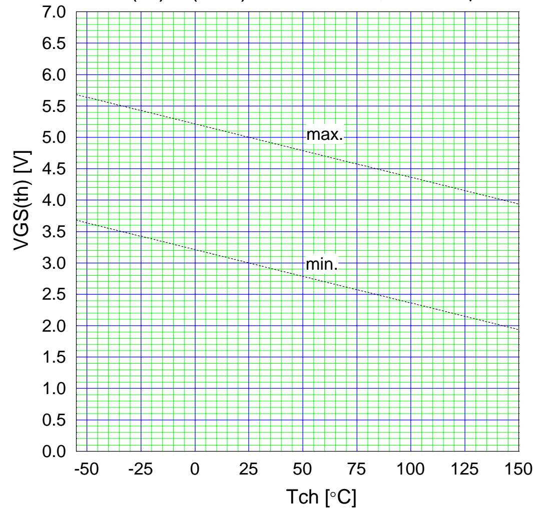




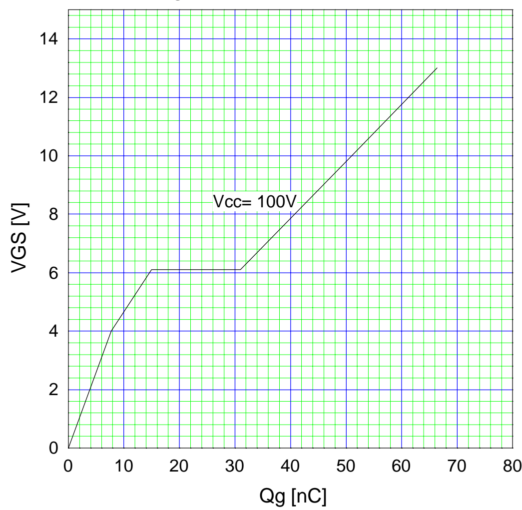
Drain-Source On-state Resistance
RDS(on)=f(Tch):ID=15A,VGS=10V



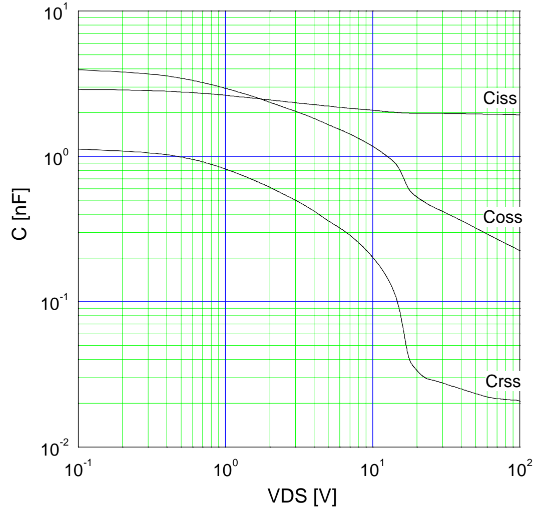
Gate Threshold Voltage vs. Tch
VGS(th)=f(Tch):VDS=VGS,ID=250μA



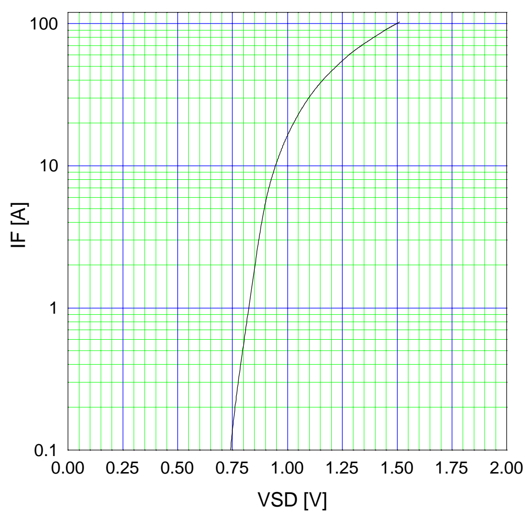
Typical Gate Charge Characteristics
VGS=f(Qg):ID=30A, Tch=25°C



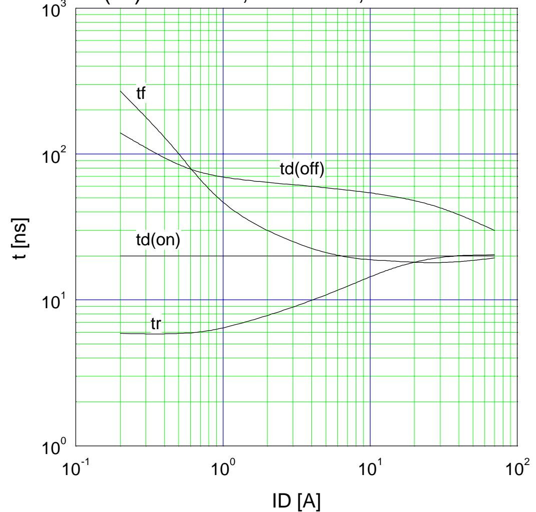
Typical Capacitance
C=f(VDS):VGS=0V,f=1MHz

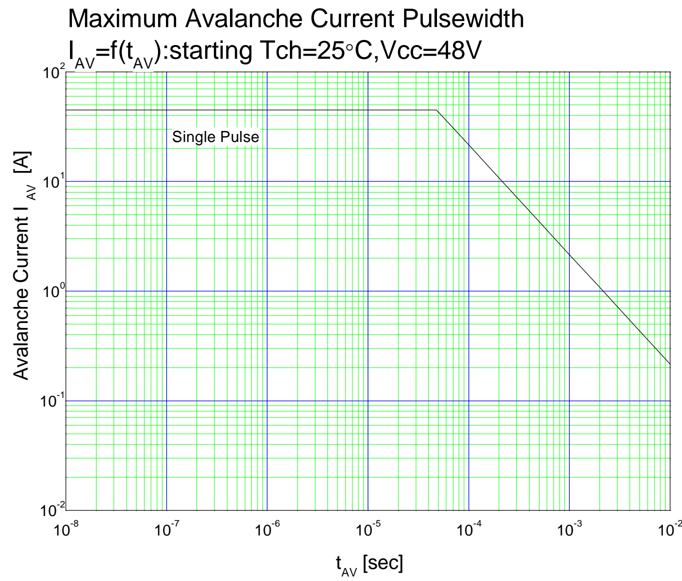


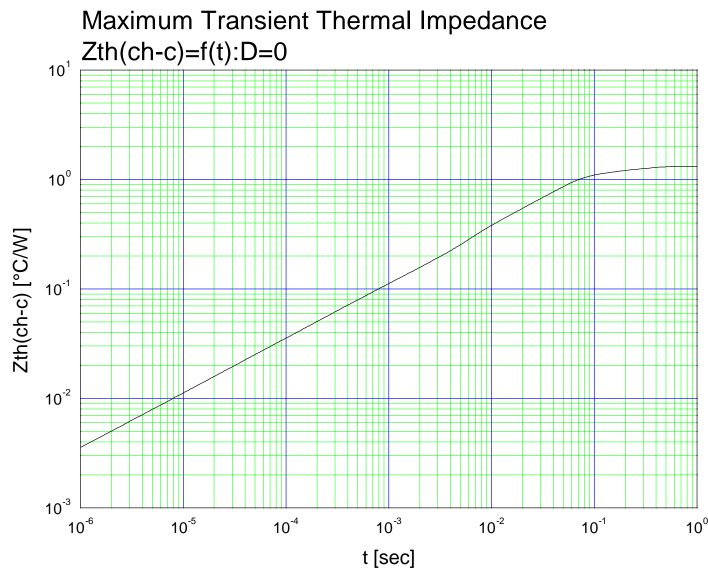
Typical Forward Characteristics of Reverse Diode
IF=f(VSD):80μs Pulse test,Tch=25°C



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




Maximum Avalanche Current Pulsewidth
IAV=f(tAV):starting Tch=25°C,Vcc=48V
Single Pulse
Avalanche Current IAV [A]
tAV [sec]
10^2
10^1
10^0
10^-1
10^-2
10^-8
10^-7
10^-6
10^-5
10^-4
10^-3
10^-2


Maximum Transient Thermal Impedance
Zth(ch-c)=f(t):D=0
Zth(ch-c) [°C/W]
t [sec]
10^1
10^0
10^-1
10^-2
10^-3
10^-6
10^-5
10^-4
10^-3
10^-2
10^-1
10^0