2SK3917-01MR FUJI POWER MOSFET

Fuji Electric

200509

Super FAP-G Series

N-CHANNEL SILICON POWER MOSFET

■ Features

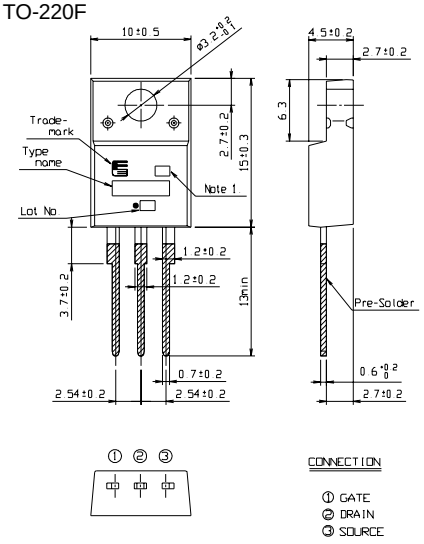
- High speed switching
- Low on-resistance
- No secondary breadown
- Low driving power
- Avalanche-proof

■ Applications

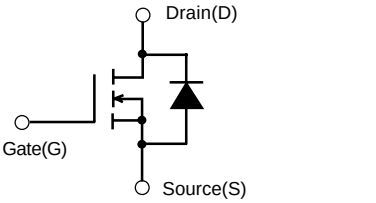
- Switching regulators
- DC-DC converters
- UPS (Uninterruptible Power Supply)

■ Outline Drawings [mm]

TO-220F



■ 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}	450	V	
	V_{DSX}	450	V	V_{GS}=-30V
Continuous drain current	I_D	4.3	A	
Pulsed drain current	$I_{D(puls)}$	±17.2	A	
Gate-source voltage	V_{GS}	±30	V	
Repetitive or non-repetitive	I_{AR}	4.3	A	Note *1
Non-repetitive Maximum avalanche energy	E_{AS}	211	mJ	Note *2
Repetitive Maximum avalanche energy		2.1	mJ	Note *3
Maximum drain-source dV/dt	dV_{DS}/dt	20	kV/μs	VDS≦450V
Peak diode recovery dV/dt	dV/dt	5	kV/μs	Note *4
Max. power dissipation	P_D	2.16	W	Ta=25°C
		21	W	Tc=25°C
Operating and storage	T_{ch}	+150	°C	
temperature range	T_{stg}	-55 to +150	°C	
Isolation voltage	V_{ISO} *6	2	kVrms	t=60sec, f=60Hz

Note *1 Tch=150°C
Note *2 Starting Tch=25°C, I_{AS}=1.8A, L=119mH, V_{CC}=45V, R_G=50Ω
E_{AS} limited by maximum channel temperrature and avalanche current.
See to 'Avalanche Energy' graph.
Note *3 Repetitve rating : Pulse width limited by maximum channel temperature.
See to 'Transient Thermal impedance' graph.
Note *4 IF≦ -ID, -di/dt=50A/μs, Vcc≦BVDSS, Tch ≦150°C

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

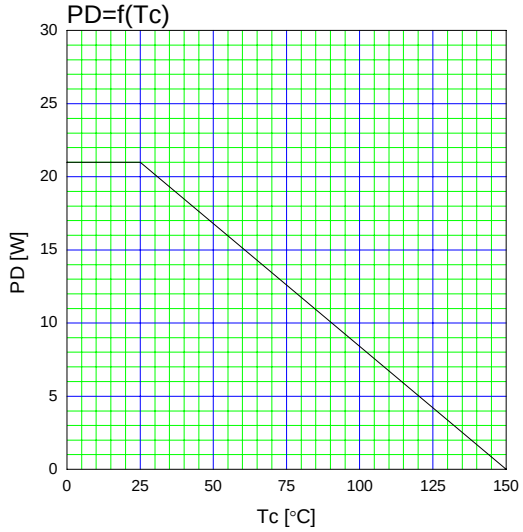
Item	Symbol	Test Conditions					
Drain-source breakdown voltage	$V_{(BR)DSS}$	I_D= 250μA V_{GS}=0V		450			V
Gate threshold voltage	$V_{GS(th)}$	I_D= 250μA V_{DS}=V_{GS}		3.0		5.0	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=450V V_{GS}=0V	Tch=25°C			25	μA
		V_{DS}=360V V_{GS}=0V	Tch=125°C			2.0	mA
Gate-source leakage current	I_{GSS}	V_{GS}=±30V V_{DS}=0V				100	nA
Drain-source on-state resistance	$R_{DS(on)}$	I_D=2.1A V_{GS}=10V			1.30	1.60	Ω
Forward transcondutance	g_{fs}	I_D=2.1A V_{DS}=25V		1.8	3.5		S
Input capacitance	C_{iss}	V_{DS}=25V			330	500	pF
Output capacitance	C_{oss}	V_{GS}=0V			50	75	
Reverse transfer capacitance	C_{rss}	f=1MHz			2	4	
Turn-on time t_{on}	$t_{d(on)}$	V_{CC}=300V I_D=2.1A			11	17.5	ns
	t_r	V_{GS}=10V			5.5	8.5	
Turn-off time t_{off}	$t_{d(off)}$	R_{GS}=10Ω			23	34.5	
	t_f				5.0	8.0	
Total Gate Charge	Q_G	V_{CC}=225V			13.0	20	nC
Gate-Source Charge	Q_{GS}	I_D=4.3A			6.0	9.0	
Gate-Drain Charge	Q_{GD}	V_{GS}=10V			2.5	3.8	
Diode forward on-voltage	V_{SD}	I_F=4.3A V_{GS}=0V Tch=25°C			1.00	1.50	V
Reverse recovery time	t_{rr}	I_F=4.3A V_{GS}=0V			280		ns
Reverse recovery charge	Q_{rr}	-di/dt=100A/μs Tch=25°C			1.6		μC

● Thermalcharacteristics

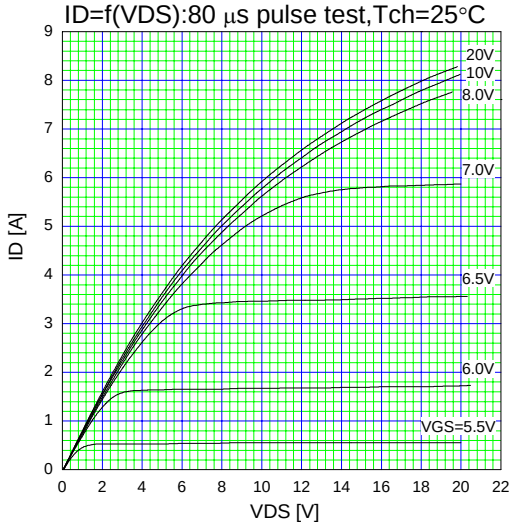
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-c)}$	channel to case			5.952	°C/W
	$R_{th(ch-a)}$	channel to ambient			58.0	°C/W

Characteristics

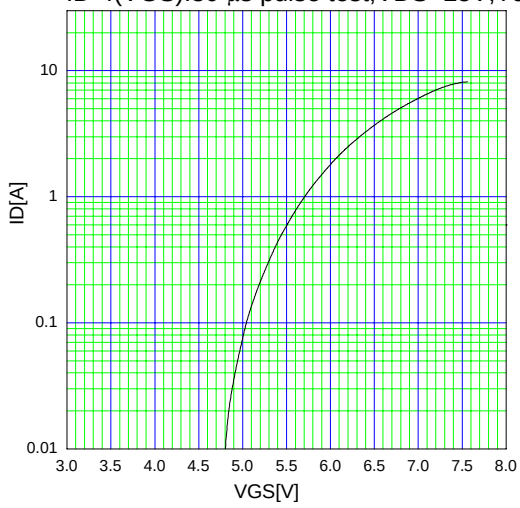
Allowable Power Dissipation
PD=f(Tc)



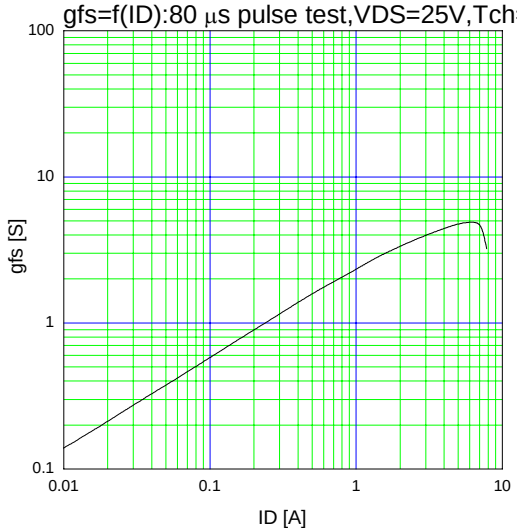
Typical Output Characteristics
ID=f(VDS):80 μs pulse test,Tch=25°C



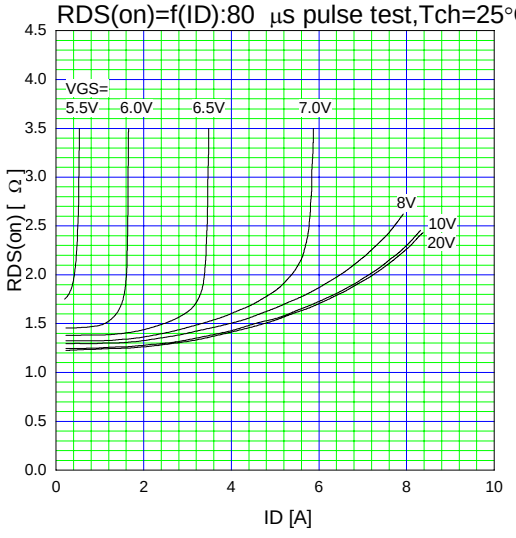
Typical Transfer Characteristic
ID=f(VGS):80 μs pulse test,VDS=25V,Tch=25°C



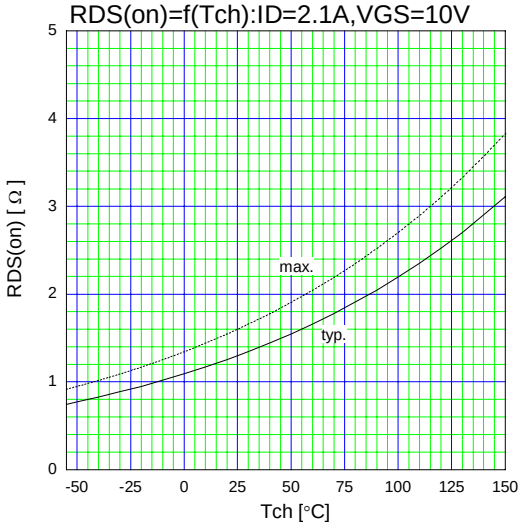
Typical Transconductance
gfs=f(ID):80 μs pulse test,VDS=25V,Tch=25°C



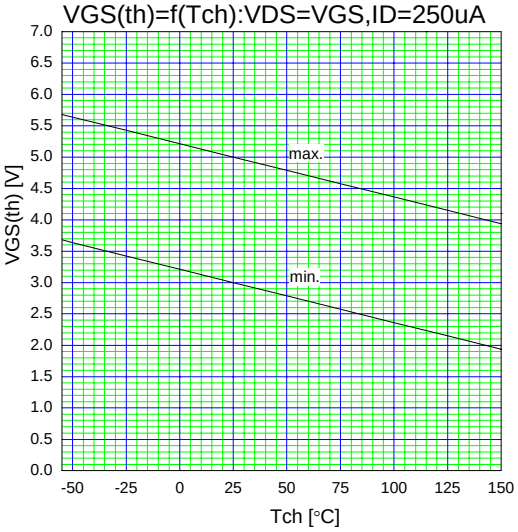
Typical Drain-Source on-state Resistance
RDS(on)=f(ID):80 μs pulse test,Tch=25°C



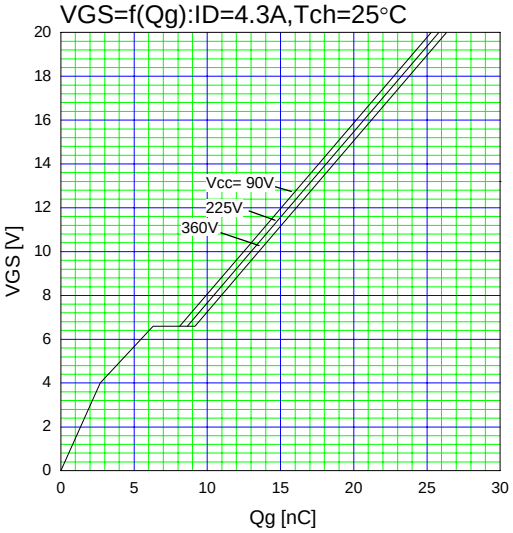
Drain-Source On-state Resistance
RDS(on)=f(Tch):ID=2.1A,VGS=10V



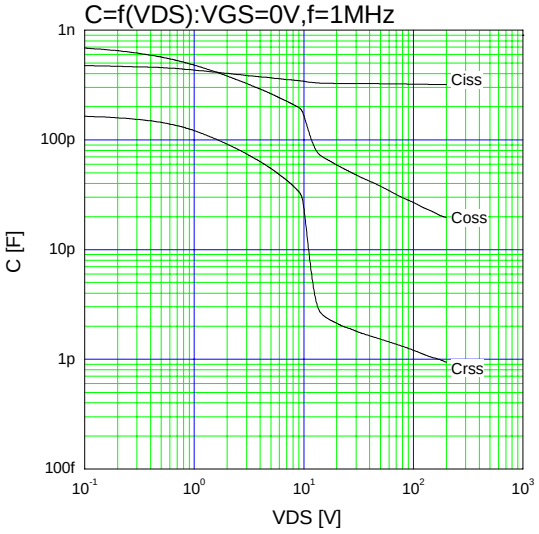
Gate Threshold Voltage vs. Tch
VGS(th)=f(Tch):VDS=VGS,ID=250uA



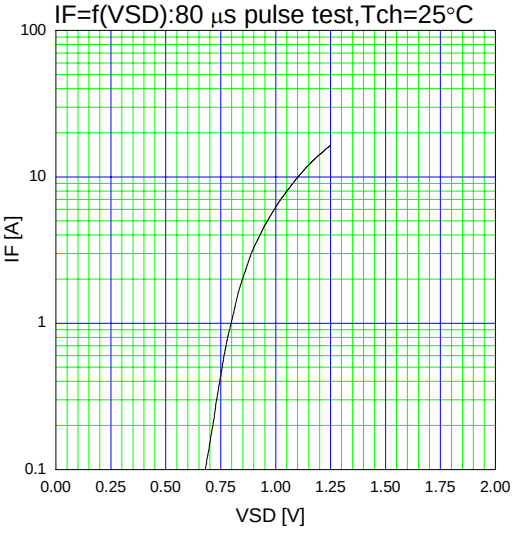
Typical Gate Charge Characteristics
VGS=f(Qg):ID=4.3A,Tch=25°C



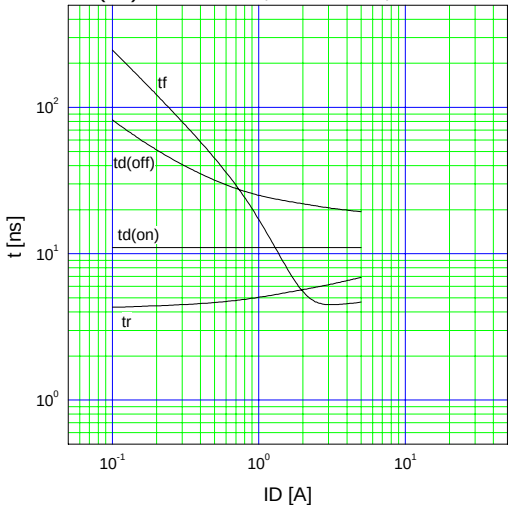
Typical Capacitance
C=f(VDS):VGS=0V,f=1MHz



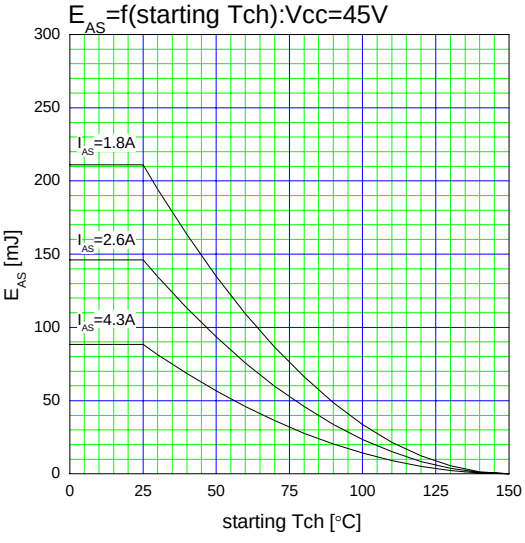
Typical Forward Characteristics of Reverse Diode
IF=f(VSD):80 μs pulse test,Tch=25°C



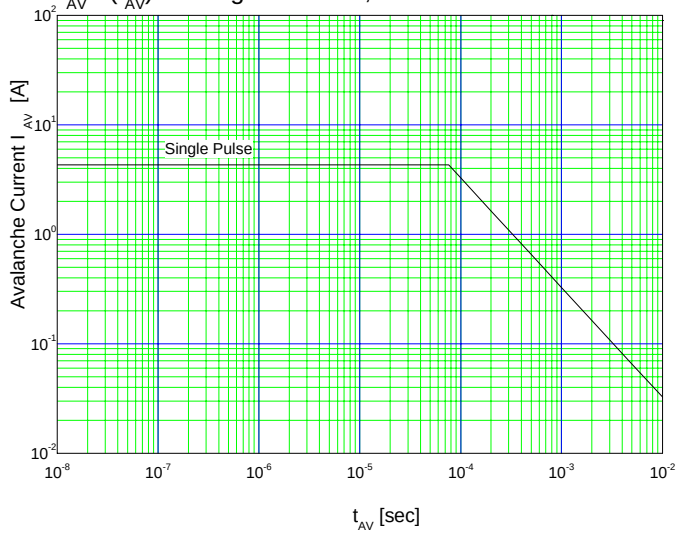
Typical Switching Characteristics vs. ID
t=f(ID):Vcc=300V,VGS=10V,RG=10Ω



Maximum Avalanche Energy vs. starting Tch
E_{AS}=f(starting Tch):Vcc=45V



Maximum Avalanche Current Pulsewidth
$I_{AV}=f(t_{AV})$:starting Tch=25°C,Vcc=45V



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