

# 2SK3469-01MR

FUJI POWER MOSFET

**Super FAP-G Series**

**N-CHANNEL SILICON POWER MOSFET**

## Features

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

## Applications

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

## Maximum ratings and characteristic Absolute maximum ratings

( $T_c=25^\circ\text{C}$  unless otherwise specified)

Item	Symbol	Ratings	Unit
Drain-source voltage	$V_{DS}$	500	V
Continuous drain current	$I_D$	$\pm 12$	A
Pulsed drain current	$I_{D(puls)}$	$\pm 48$	A
Gate-source voltage	$V_{GS}$	$\pm 30$	V
Repetitive or non-repetitive	$I_{AR}^*2$	12	A
Maximum Avalanche Energy	$E_{AS}^*1$	217	mJ
Maximum Drain-Source $dV/dt$	$dV_{DS}/dt$	20	kV/ $\mu\text{s}$
Peak Diode Recovery $dV/dt$	$dV/dt^*3$	5	kV/ $\mu\text{s}$
Max. power dissipation	$P_D$	$T_a=25^\circ\text{C}$	2.16
		$T_c=25^\circ\text{C}$	50
Operating and storage temperature range	$T_{ch}$	+150	$^\circ\text{C}$
	$T_{stg}$	-55 to +150	$^\circ\text{C}$

\*1  $L=2.77\text{mH}$ ,  $V_{cc}=50\text{V}$  \*2  $T_{ch}\leq 150^\circ\text{C}$  \*3  $I_F\leq -I_D$ ,  $-di/dt=50\text{A}/\mu\text{s}$ ,  $V_{cc}\leq BV_{DSS}$ ,  $T_{ch}\leq 150^\circ\text{C}$

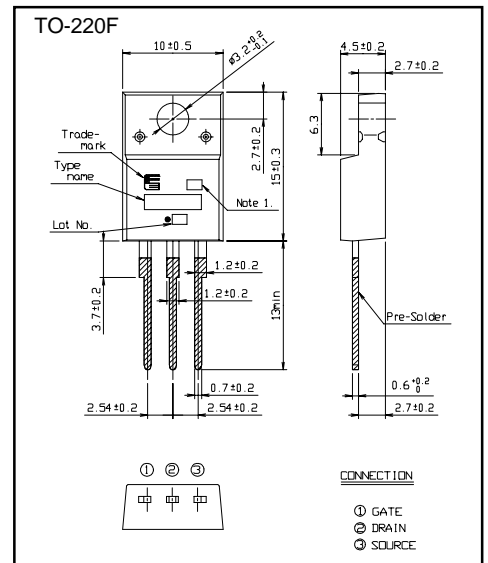
## Electrical characteristics ( $T_c = 25^\circ\text{C}$ unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D=250\mu\text{A}$ $V_{GS}=0\text{V}$	500			V
Gate threshold voltage	$V_{GS(th)}$	$I_D=250\mu\text{A}$ $V_{DS}=V_{GS}$	3.0		5.0	V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=500\text{V}$ $V_{GS}=0\text{V}$			25	$\mu\text{A}$
		$V_{DS}=400\text{V}$ $V_{GS}=0\text{V}$			250	
Gate-source leakage current	$I_{GSS}$	$V_{GS}=\pm 30\text{V}$ $V_{DS}=0\text{V}$		10	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$I_D=6\text{A}$ $V_{GS}=10\text{V}$		0.40	0.52	$\Omega$
Forward transconductance	$g_{fs}$	$I_D=6\text{A}$ $V_{DS}=25\text{V}$	5.5	11		S
Input capacitance	$C_{iss}$	$V_{DS}=25\text{V}$		1200	1800	pF
Output capacitance	$C_{oss}$	$V_{GS}=0\text{V}$		140	210	
Reverse transfer capacitance	$C_{rss}$	$f=1\text{MHz}$		6.0	9.0	
Turn-on time $t_{on}$	$t_{d(on)}$	$V_{cc}=300\text{V}$ $I_D=6\text{A}$		17	26	ns
	$t_r$	$V_{GS}=10\text{V}$		15	23	
Turn-off time $t_{off}$	$t_{d(off)}$	$R_{GS}=10\ \Omega$		34	51	
	$t_f$			7	11	
Total Gate Charge	$Q_G$	$V_{cc}=250\text{V}$		30	45	nC
Gate-Source Charge	$Q_{GS}$	$I_D=12\text{A}$		11	16.5	
Gate-Drain Charge	$Q_{GD}$	$V_{GS}=10\text{V}$		10	15	
Avalanche capability	$I_{AV}$	$L=2.77\text{mH}$ $T_{ch}=25^\circ\text{C}$	12			A
Diode forward on-voltage	$V_{SD}$	$I_F=12\text{A}$ $V_{GS}=0\text{V}$ $T_{ch}=25^\circ\text{C}$		1.00	1.50	V
Reverse recovery time	$t_{rr}$	$I_F=12\text{A}$ $V_{GS}=0\text{V}$		0.7		$\mu\text{s}$
Reverse recovery charge	$Q_{rr}$	$-di/dt=100\text{A}/\mu\text{s}$ $T_{ch}=25^\circ\text{C}$		4.5		$\mu\text{C}$

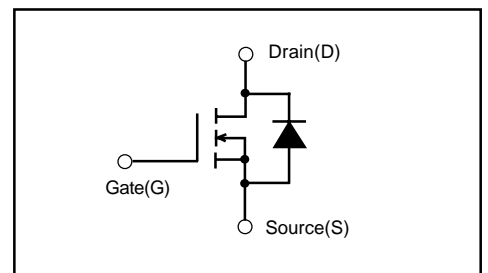
## Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-c)}$	channel to case			2.50	$^\circ\text{C}/\text{W}$
	$R_{th(ch-a)}$	channel to ambient			58.0	$^\circ\text{C}/\text{W}$

## Outline Drawings

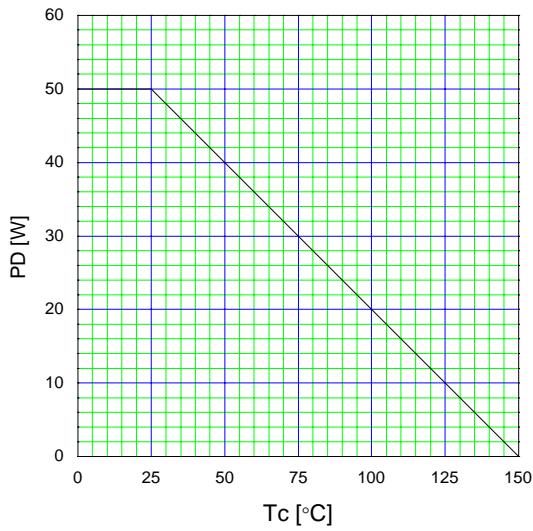


## Equivalent circuit schematic

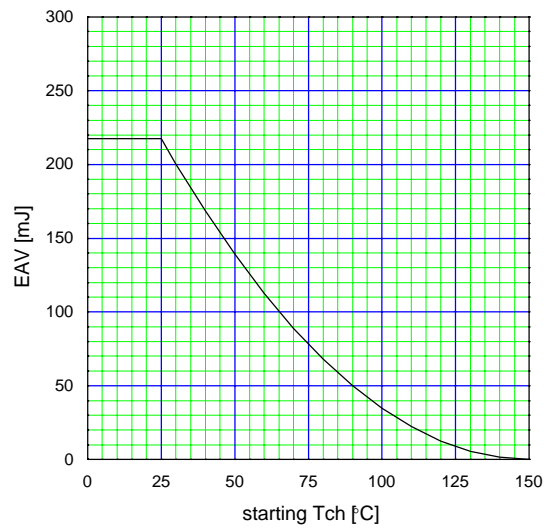


Characteristics

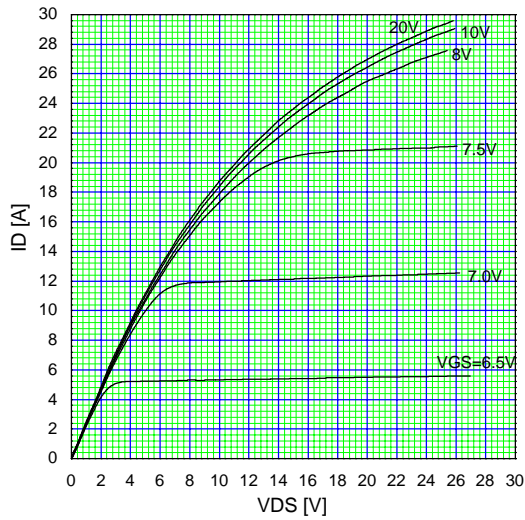
Allowable Power Dissipation  
 $PD=f(T_c)$



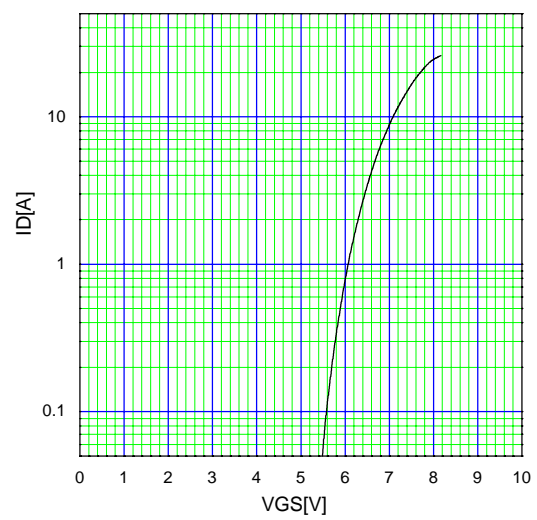
Maximum Avalanche Energy vs. starting T<sub>ch</sub>  
 $E(AV)=f(\text{starting } T_{ch}):V_{cc}=50V, I(AV)\leq 12A$



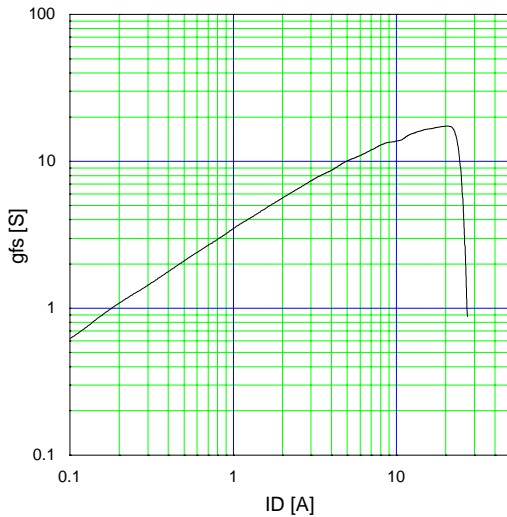
Typical Output Characteristics  
 $I_D=f(V_{DS}):80\mu s \text{ Pulse test}, T_{ch}=25^\circ C$



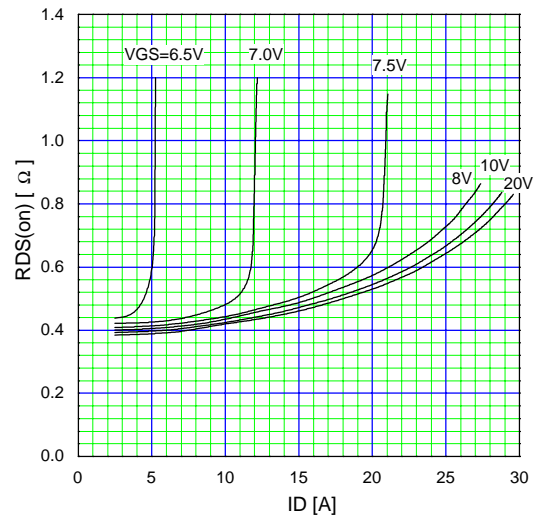
Typical Transfer Characteristic  
 $I_D=f(V_{GS}):80\mu s \text{ Pulse test}, V_{DS}=25V, T_{ch}=25^\circ C$



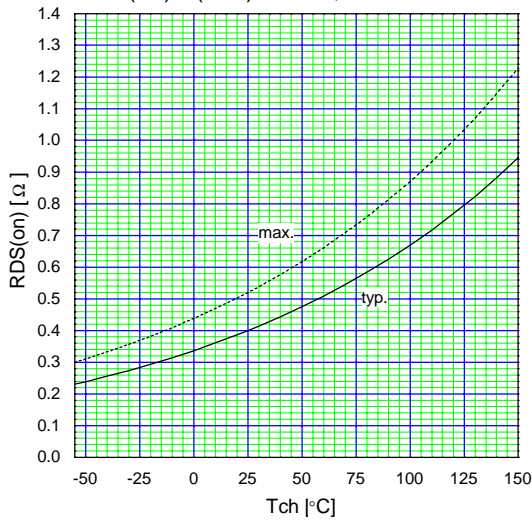
Typical Transconductance  
 $g_{fs}=f(I_D):80\mu s \text{ Pulse test}, V_{DS}=25V, T_{ch}=25^\circ C$



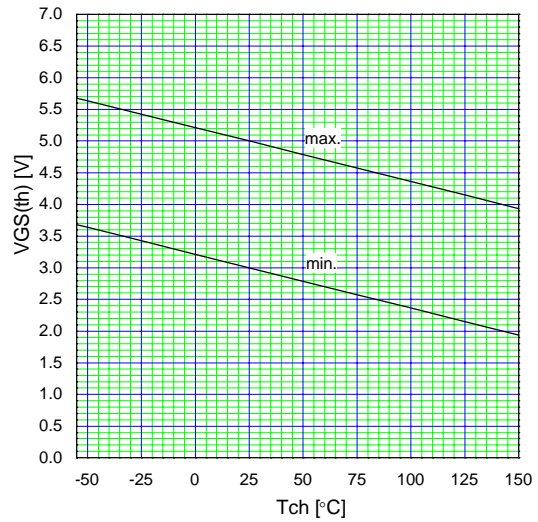
Typical Drain-Source on-state Resistance  
 $R_{DS(on)}=f(I_D):80\mu s \text{ Pulse test}, T_{ch}=25^\circ C$



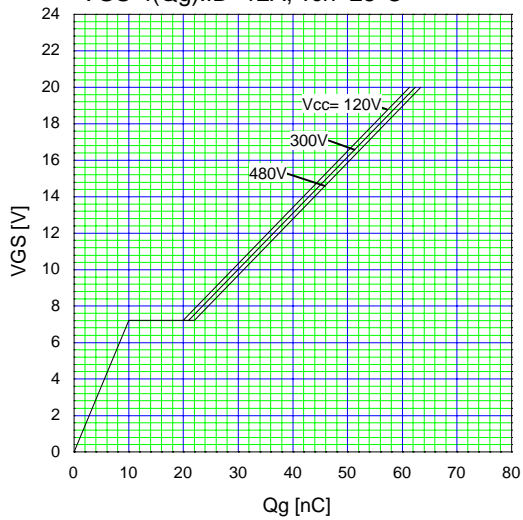
Drain-Source On-state Resistance  
 $R_{DS(on)}=f(T_{ch}):I_D=6A, V_{GS}=10V$



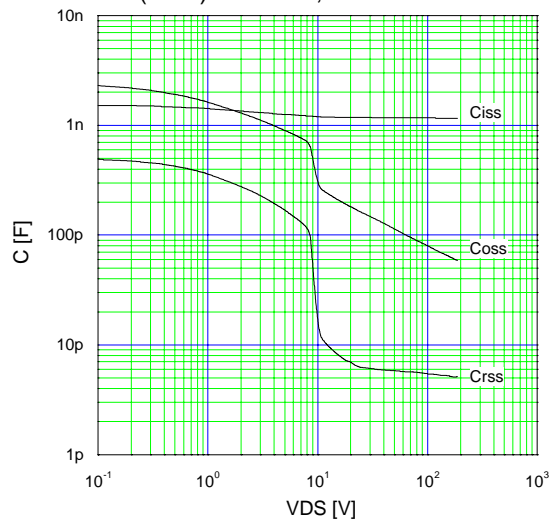
Gate Threshold Voltage vs. T<sub>ch</sub>  
 $V_{GS(th)}=f(T_{ch}):V_{DS}=V_{GS}, I_D=250\mu A$



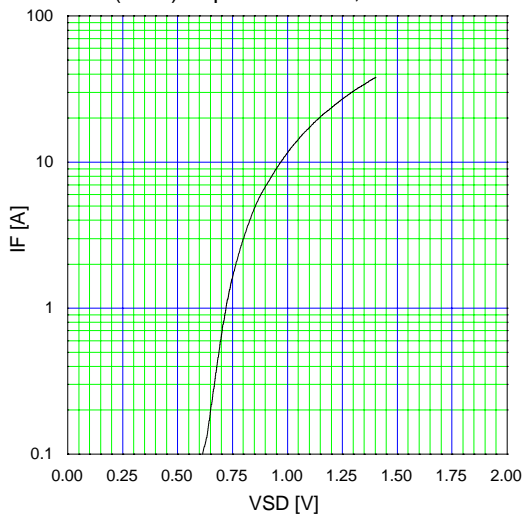
Typical Gate Charge Characteristics  
 $V_{GS}=f(Q_g):I_D=12A, T_{ch}=25^\circ C$



Typical Capacitance  
 $C=f(V_{DS}):V_{GS}=0V, f=1MHz$



Typical Forward Characteristics of Reverse Diode  
 $I_F=f(V_{SD}):80\mu s \text{ Pulse test}, T_{ch}=25^\circ C$



Typical Switching Characteristics vs. I<sub>D</sub>  
 $t=f(I_D):V_{CC}=300V, V_{GS}=10V, R_G=10\Omega$

