

## 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	$V_{DS}$	150	V
	$V_{DSX}^*5$	120	V
Continuous drain current	$I_D$	$\pm 23$	A
Pulsed drain current	$I_{D(puls)}$	$\pm 92$	A
Gate-source voltage	$V_{GS}$	$\pm 30$	V
Repetitive or non-repetitive	$I_{AR}^*2$	23	A
Maximum Avalanche Energy	$E_{AS}^*1$	242	mJ
Maximum Drain-Source dV/dt	$dV_{DS}/dt^*4$	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
		$T_c=25^\circ\text{C}$	40
Operating and storage temperature range	$T_{ch}$	+150	$^\circ\text{C}$
	$T_{stg}$	-55 to +150	$^\circ\text{C}$
Isolation Voltage	$V_{iso}^*6$	2	kVrms

\*1  $L=671\mu\text{H}$ ,  $V_{CC}=48\text{V}$  \*2  $T_{ch}\leq 150^\circ\text{C}$  \*3  $I_F\leq I_D$ ,  $-di/dt=50\text{A}/\mu\text{s}$ ,  $V_{CC}\leq BV_{DSS}$ ,  $T_{ch}\leq 150^\circ\text{C}$

\*4  $V_{DS}\leq 150\text{V}$  \*5  $V_{GS}=-30\text{V}$  \*6  $t=60\text{sec}$ ,  $f=60\text{Hz}$

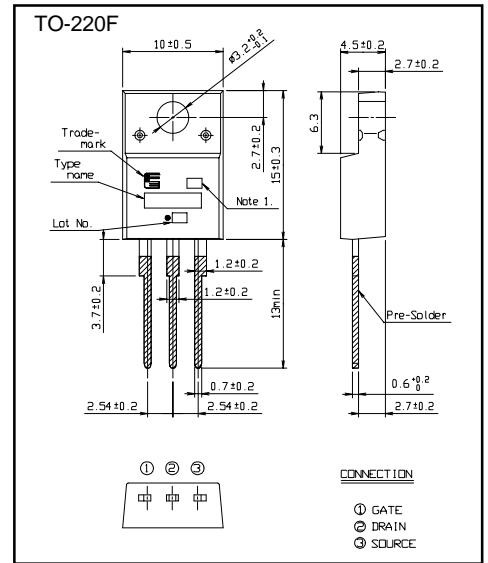
### Electrical characteristics ( $T_c=25^\circ\text{C}$ unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D=250\mu\text{A}$ $V_{GS}=0\text{V}$	150			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	$I_{DSS}$	$V_{DS}=150\text{V}$ $V_{GS}=0\text{V}$			25	$\mu\text{A}$
		$V_{DS}=120\text{V}$ $V_{GS}=0\text{V}$			250	$\mu\text{A}$
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	$R_{DS(on)}$	$I_D=11.5\text{A}$ $V_{GS}=10\text{V}$		54	70	$\text{m}\Omega$
Forward transconductance	$g_{fs}$	$I_D=11.5\text{A}$ $V_{DS}=25\text{V}$	8	16		S
Input capacitance	$C_{iss}$	$V_{DS}=75\text{V}$		1150	1730	pF
Output capacitance	$C_{oss}$	$V_{GS}=0\text{V}$		200	300	pF
Reverse transfer capacitance	$C_{rss}$	$f=1\text{MHz}$		17	26	pF
Turn-on time $t_{on}$	$t_{d(on)}$	$V_{CC}=48\text{V}$ $I_D=11.5\text{A}$		13	20	ns
	$t_r$	$V_{GS}=10\text{V}$		15	23	
Turn-off time $t_{off}$	$t_{d(off)}$	$R_{GS}=10\Omega$		34	51	ns
	$t_f$			15	23	
Total Gate Charge	$Q_G$	$V_{CC}=48\text{V}$		34	51	nC
Gate-Source Charge	$Q_{GS}$	$I_D=23\text{A}$		9	13.5	
Gate-Drain Charge	$Q_{GD}$	$V_{GS}=10\text{V}$		12.5	19	
Avalanche capability	$I_{AV}$	$L=100\mu\text{H}$ $T_{ch}=25^\circ\text{C}$	23			A
Diode forward on-voltage	$V_{SD}$	$I_F=30\text{A}$ $V_{GS}=0\text{V}$ $T_{ch}=25^\circ\text{C}$		1.10	1.65	V
Reverse recovery time	$t_{rr}$	$I_F=23\text{A}$ $V_{GS}=0\text{V}$		130		ns
Reverse recovery charge	$Q_{rr}$	$-di/dt=100\text{A}/\mu\text{s}$ $T_{ch}=25^\circ\text{C}$		0.6		$\mu\text{C}$

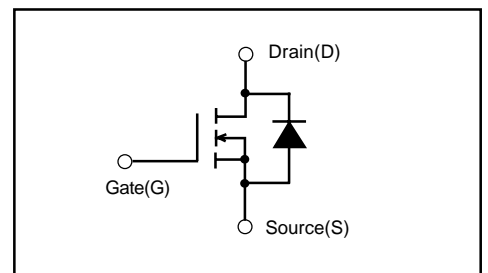
### Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-c)}$	channel to case			3.125	$^\circ\text{C}/\text{W}$
	$R_{th(ch-a)}$	channel to ambient			58.0	$^\circ\text{C}/\text{W}$

### Outline Drawings



### Equivalent circuit schematic



Characteristics

