

## 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	$V_{DS}$	700	V
	$V_{DSX}^*5$	700	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	$E_{AS}^*1$	276.7	mJ
Maximum Drain-Source dV/dt	$dV_{DS}/dt^*4$	40	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
		$T_c=25^\circ\text{C}$	95
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  $L=3.53\text{mH}$ ,  $V_{CC}=70\text{V}$ ,  $T_{ch}=25^\circ\text{C}$ , See to Avalanche Energy Graph \*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  $V_{DS}\leq 700\text{V}$  \*5  $V_{GS}=-30\text{V}$  \*6  $t=60\text{sec}$ ,  $f=60\text{Hz}$

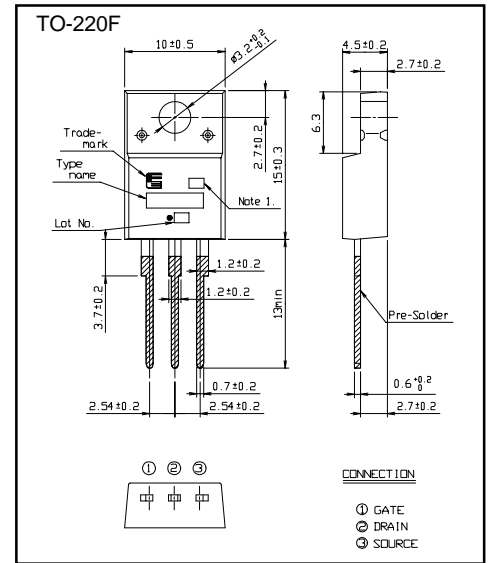
#### Electrical characteristics ( $T_c=25^\circ\text{C}$ unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D=250\mu\text{A}$ $V_{GS}=0\text{V}$	700			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	$I_{DSS}$	$V_{DS}=700\text{V}$ $V_{GS}=0\text{V}$ $T_{ch}=25^\circ\text{C}$			25	$\mu\text{A}$
		$V_{DS}=560\text{V}$ $V_{GS}=0\text{V}$ $T_{ch}=125^\circ\text{C}$			250	
Gate-source leakage current	$I_{GSS}$	$V_{GS}=\pm 30\text{V}$ $V_{DS}=0\text{V}$			100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$I_D=6\text{A}$ $V_{GS}=10\text{V}$		0.72	0.93	$\Omega$
Forward transconductance	$g_{fs}$	$I_D=6\text{A}$ $V_{DS}=25\text{V}$	6	12		S
Input capacitance	$C_{iss}$	$V_{DS}=25\text{V}$		1100	1650	pF
Output capacitance	$C_{oss}$	$V_{GS}=0\text{V}$		170	255	
Reverse transfer capacitance	$C_{rss}$	$f=1\text{MHz}$		11	17	
Turn-on time $t_{on}$	$t_{d(on)}$	$V_{CC}=300\text{V}$ $I_D=6\text{A}$		24.5	36	ns
	$t_r$	$V_{GS}=10\text{V}$		7.5	12	
Turn-off time $t_{off}$	$t_{d(off)}$	$R_{GS}=10\Omega$		47.5	72	
	$t_f$			10	17	
Total Gate Charge	$Q_G$	$V_{CC}=350\text{V}$		31	46.5	nC
Gate-Source Charge	$Q_{GS}$	$I_D=12\text{A}$		4.5	8	
Gate-Drain Charge	$Q_{GD}$	$V_{GS}=10\text{V}$		11	16.5	
Avalanche capability	$I_{AV}$	$L=3.53\text{mH}$ $T_{ch}=25^\circ\text{C}$	12			A
Diode forward on-voltage	$V_{SD}$	$I_F=12\text{A}$ $V_{GS}=0\text{V}$ $T_{ch}=25^\circ\text{C}$		0.90	1.50	V
Reverse recovery time	$t_{rr}$	$I_F=12\text{A}$ $V_{GS}=0\text{V}$		2.6		$\mu\text{s}$
Reverse recovery charge	$Q_{rr}$	$-di/dt=100\text{A}/\mu\text{s}$ $T_{ch}=25^\circ\text{C}$		16.0		$\mu\text{C}$

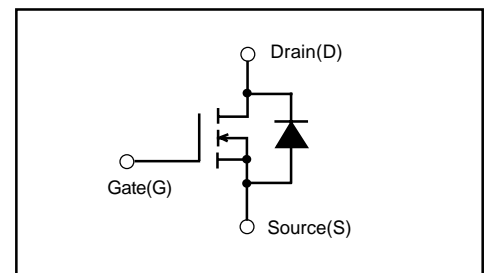
#### Thermal characteristics

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

#### Outline Drawings [mm]



#### Equivalent circuit schematic



Characteristics

