

## 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	$V_{DS}$	200	V
	$V_{DSX}^{*5}$	220	V
Continuous drain current	$I_D$	$\pm 25$	A
Pulsed drain current	$I_{D(puls)}$	$\pm 100$	A
Gate-source voltage	$V_{GS}$	$\pm 30$	V
Non-repetitive Avalanche current	$I_{AS}^{*2}$	25	A
Maximum Avalanche Energy	$E_{AS}^{*1}$	372	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	$P_D$	$T_a=25^\circ\text{C}$	3.10
		$T_c=25^\circ\text{C}$	85
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  $L=1\text{mH}$ ,  $V_{CC}=48\text{V}$  \*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  $V_{DS} \leq 250\text{V}$  \*5  $V_{GS} = -30\text{V}$  \*6  $t=60\text{sec}$   $f=60\text{Hz}$

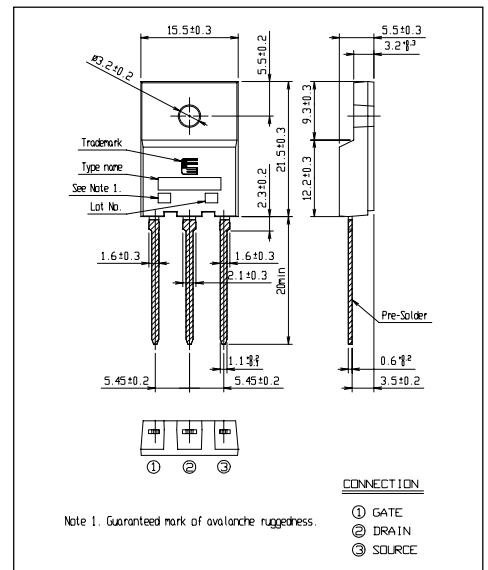
#### Electrical characteristics ( $T_c = 25^\circ\text{C}$ unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D = 250\mu\text{A}$ $V_{GS} = 0\text{V}$	250			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	$I_{DSS}$	$V_{DS} = 250\text{V}$ $V_{GS} = 0\text{V}$			25	$\mu\text{A}$
		$V_{DS} = 200\text{V}$ $V_{GS} = 0\text{V}$			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	$R_{DS(on)}$	$I_D = 12.5\text{A}$ $V_{GS} = 10\text{V}$		75	100	$\text{m}\Omega$
Forward transconductance	$g_{fs}$	$I_D = 12.5\text{A}$ $V_{DS} = 25\text{V}$	8	16		S
Input capacitance	$C_{iss}$	$V_{DS} = 75\text{V}$		2000	3000	pF
Output capacitance	$C_{oss}$	$V_{GS} = 0\text{V}$		400	600	pF
Reverse transfer capacitance	$C_{rss}$	$f = 1\text{MHz}$		25	38	pF
Turn-on time $t_{on}$	$t_{d(on)}$	$V_{CC} = 72\text{V}$ $I_D = 12.5\text{A}$		20	30	ns
	$t_r$	$V_{GS} = 10\text{V}$		30	45	ns
Turn-off time $t_{off}$	$t_{d(off)}$	$R_{GS} = 10\Omega$		60	90	ns
	$t_f$			20	30	ns
Total Gate Charge	$Q_G$	$V_{CC} = 72\text{V}$		44	66	nC
Gate-Source Charge	$Q_{GS}$	$I_D = 12\text{A}$		14	21	nC
Gate-Drain Charge	$Q_{GD}$	$V_{GS} = 10\text{V}$		16	24	nC
Avalanche capability	$I_{AV}$	$L = 100\mu\text{H}$ $T_{ch} = 25^\circ\text{C}$	25			A
Diode forward on-voltage	$V_{SD}$	$I_F = 25\text{A}$ $V_{GS} = 0\text{V}$ $T_{ch} = 25^\circ\text{C}$		1.10	1.65	V
Reverse recovery time	$t_{rr}$	$I_F = 25\text{A}$ $V_{GS} = 0\text{V}$		0.45		$\mu\text{s}$
Reverse recovery charge	$Q_{rr}$	$-di/dt = 100\text{A}/\mu\text{s}$ $T_{ch} = 25^\circ\text{C}$		1.5		$\mu\text{C}$

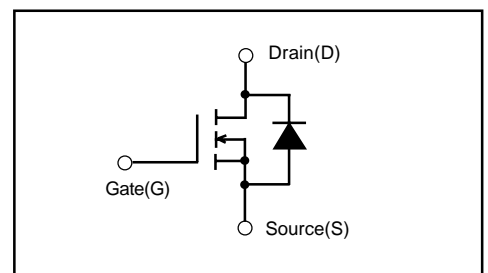
#### Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-c)}$	channel to case			1.471	$^\circ\text{C}/\text{W}$
	$R_{th(ch-a)}$	channel to ambient			40.0	$^\circ\text{C}/\text{W}$

#### Outline Drawings (mm)



#### Equivalent circuit schematic



## Characteristics

