

## 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
- DC-DC converters
- UPS (Uninterruptible Power Supply)

### Maximum ratings and characteristic Absolute maximum ratings

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

Item	Symbol	Rated	Unit	Remarks
Drain-source voltage	$V_{DS}$	600	V	
	$V_{DSX}$	600	V	$V_{GS}=-30\text{V}$
Continuous drain current	$I_D$	$\pm 43$	A	
Pulsed drain current	$I_{D(puls)}$	$\pm 172$	A	
Gate-source voltage	$V_{GS}$	$\pm 30$	V	
Non-Repetitive Maximum avalanche current	$I_{AS}$	43	A	$T_{ch}=25^\circ\text{C}$ *1
Repetitive or Maximum avalanche current	$I_{AR}$	21.5	A	$T_{ch}\leq 150^\circ\text{C}$ *1
Non-Repetitive Maximum avalanche energy	$E_{AS}$	808.9	mJ	$L=802\mu\text{H}$ $V_{CC}=60\text{V}$ *2
Maximum Drain-Source dV/dt	$dV_{DS}/dt$	20	kV/s	$V_{DS}\leq 600\text{V}$
Peak diode recovery dV/dt	$dV/dt$	5	kV/ $\mu\text{s}$	*3
Max. power dissipation	$P_D$	2.50	W	$T_a=25^\circ\text{C}$
		600	W	$T_c=25^\circ\text{C}$
Operating and storage temperature range	$T_{ch}$	+150	$^\circ\text{C}$	
	$T_{stg}$	-55 to +150	$^\circ\text{C}$	

\*1 See to Avalanche Current Graph

\*2 See to Avalanche Energy Graph

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

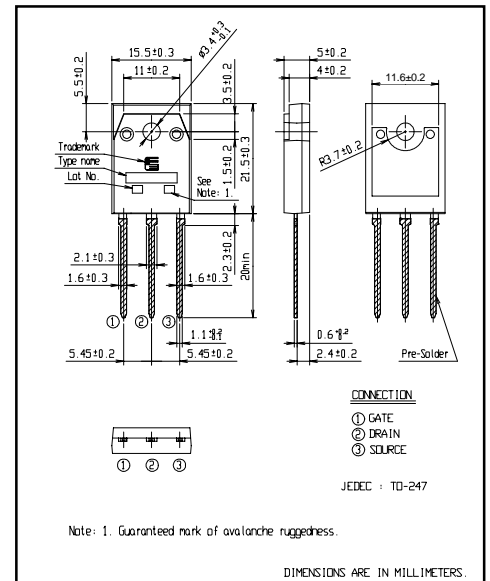
### Electrical characteristics ( $T_c=25^\circ\text{C}$ unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D=250\mu\text{A}$ $V_{GS}=0\text{V}$	600			V
Gate threshold voltage	$V_{GS(th)}$	$I_D=250\mu\text{A}$ $V_{DS}=V_{GS}$	3.0			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=600\text{V}$ $V_{GS}=0\text{V}$ $T_{ch}=25^\circ\text{C}$			25	$\mu\text{A}$
		$V_{DS}=480\text{V}$ $V_{GS}=0\text{V}$ $T_{ch}=125^\circ\text{C}$			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	$R_{DS(on)}$	$I_D=26\text{A}$ $V_{GS}=10\text{V}$		0.12	0.16	$\Omega$
Forward transconductance	$g_{fs}$	$I_D=21.5\text{A}$ $V_{DS}=25\text{V}$	15	30		S
Input capacitance	$C_{iss}$	$V_{DS}=25\text{V}$		5360	8040	pF
Output capacitance	$C_{oss}$	$V_{GS}=0\text{V}$		680	1020	pF
Reverse transfer capacitance	$C_{rss}$	$f=1\text{MHz}$		40	60	pF
Turn-on time $t_{on}$	$t_{d(on)}$	$V_{CC}=300\text{V}$ $I_D=21.5\text{A}$		80	120	ns
	$t_r$	$V_{GS}=10\text{V}$		87	131	ns
Turn-off time $t_{off}$	$t_{d(off)}$	$R_{GS}=10\Omega$		190	285	ns
	$t_f$			44	66	ns
Total Gate Charge	$Q_G$	$V_{CC}=300\text{V}$		112	168	nC
Gate-Source Charge	$Q_{GS}$	$I_D=43\text{A}$		34	51	nC
Gate-Drain Charge	$Q_{GD}$	$V_{GS}=10\text{V}$		40	60	nC
Avalanche capability	$I_{AV}$	$L=802\mu\text{H}$ $T_{ch}=25^\circ\text{C}$	43			A
Diode forward on-voltage	$V_{SD}$	$I_F=43\text{A}$ $V_{GS}=0\text{V}$ $T_{ch}=25^\circ\text{C}$		1.00	1.50	V
Reverse recovery time	$t_{rr}$	$I_F=43\text{A}$ $V_{GS}=0\text{V}$		0.98		$\mu\text{s}$
Reverse recovery charge	$Q_{rr}$	$-di/dt=100\text{A}/\mu\text{s}$ $T_{ch}=25^\circ\text{C}$		22.0		$\mu\text{C}$

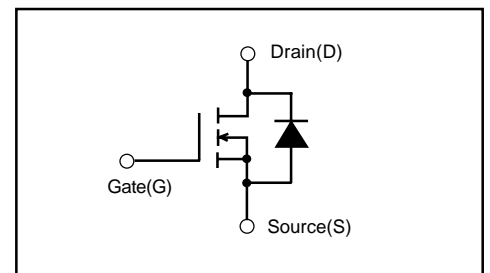
### Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-c)}$	channel to case			0.208	$^\circ\text{C}/\text{W}$
	$R_{th(ch-a)}$	channel to ambient			50.0	$^\circ\text{C}/\text{W}$

### Outline Drawings [mm]



### Equivalent circuit schematic



Characteristics

