

## FUJI POWER MOSFET

## N-CHANNEL SILICON POWER MOSFET

# Super FAP-G Series

### 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
	$V_{DSX} *5$	500	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
Repetitive or non-repetitive	$I_{AR} *2$	25	A
Maximum Avalanche Energy	$E_{AS} *1$	336.5	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	$P_D$	$T_a=25^\circ\text{C}$	2.50
		$T_c=25^\circ\text{C}$	335
Operating and storage temperature range	$T_{ch}$	+150	$^\circ\text{C}$
	$T_{stg}$	-55 to +150	$^\circ\text{C}$

\*1  $L=987\mu\text{H}$ ,  $V_{CC}=50\text{V}$ , 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  $V_{DS} \leq 500\text{V}$  \*5  $V_{GS} = -30\text{V}$

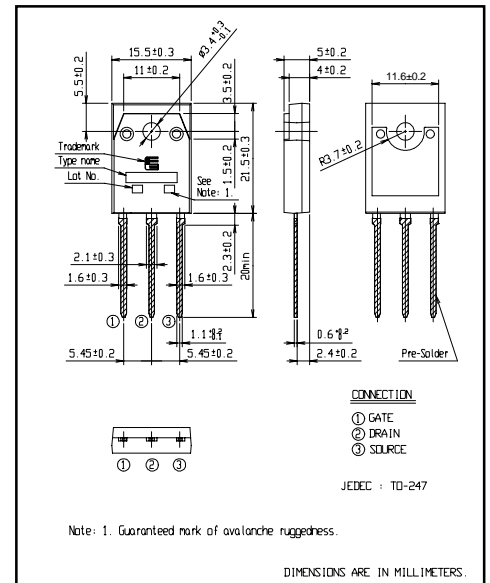
### Electrical characteristics ( $T_c = 25^\circ\text{C}$ unless otherwise specified)

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	$\mu\text{A}$
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	$R_{DS(on)}$	$I_D = 10.5\text{A}$ $V_{GS} = 10\text{V}$		0.20	0.26	$\Omega$
Forward transconductance	$g_{fs}$	$I_D = 10.5\text{A}$ $V_{DS} = 25\text{V}$	11	22		S
Input capacitance	$C_{iss}$	$V_{DS} = 25\text{V}$		2280	3420	pF
Output capacitance	$C_{oss}$	$V_{GS} = 0\text{V}$		320	480	pF
Reverse transfer capacitance	$C_{rss}$	$f = 1\text{MHz}$		16	24	pF
Turn-on time $t_{on}$	$t_{d(on)}$	$V_{CC} = 300\text{V}$ $I_D = 10.5\text{A}$		27	41	ns
	$t_r$	$V_{GS} = 10\text{V}$		37	56	ns
Turn-off time $t_{off}$	$t_{d(off)}$	$R_{GS} = 10\Omega$		75	113	ns
	$t_f$			11	17	ns
Total Gate Charge	$Q_G$	$V_{CC} = 300\text{V}$		54	81	nC
Gate-Source Charge	$Q_{GS}$	$I_D = 21\text{A}$		16	24	nC
Gate-Drain Charge	$Q_{GD}$	$V_{GS} = 10\text{V}$		20	30	nC
Avalanche capability	$I_{AV}$	$L = 987\mu\text{H}$ $T_{ch} = 25^\circ\text{C}$	25			A
Diode forward on-voltage	$V_{SD}$	$I_F = 21\text{A}$ $V_{GS} = 0\text{V}$ $T_{ch} = 25^\circ\text{C}$		0.98	1.50	V
Reverse recovery time	$t_{rr}$	$I_F = 21\text{A}$ $V_{GS} = 0\text{V}$		0.7		$\mu\text{s}$
Reverse recovery charge	$Q_{rr}$	$-di/dt = 100\text{A}/\mu\text{s}$ $T_{ch} = 25^\circ\text{C}$		10.0		$\mu\text{C}$

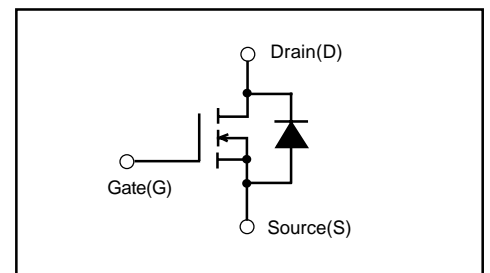
### Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-c)}$	channel to case			0.373	$^\circ\text{C}/\text{W}$
	$R_{th(ch-a)}$	channel to ambient			50.0	$^\circ\text{C}/\text{W}$

### Outline Drawings [mm]



### Equivalent circuit schematic



■ Characteristics

