

# 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	Ratings	Unit	Remarks
Drain-source voltage	$V_{DS}$	500	V	
Continuous drain current	$I_D$	$\pm 16$	A	
Pulsed drain current	$I_D(\text{puls})$	$\pm 64$	A	
Gate-source voltage	$V_{GS}$	$\pm 30$	V	
Repetitive and Non-Repetitive Maximum avalanche current	$I_{AS}$	16	A	$T_{ch} \leq 150^\circ\text{C}$
Non-Repetitive Maximum avalanche energy	$E_{AS}$	212.2	mJ	*1
Maximum Drain-Source dV/dt	$dV_{DS}/dt$	20	kV/s	$V_{DS} \leq 500\text{V}$
Peak diode recovery dV/dt	$dV/dt$	5	kV/ $\mu\text{s}$	*2
Max. power dissipation	$P_D$	3.13	W	$T_a=25^\circ\text{C}$
		95		$T_c=25^\circ\text{C}$
Operating and storage temperature range	$T_{ch}$	+150	$^\circ\text{C}$	
	$T_{stg}$	-55 to +150	$^\circ\text{C}$	
Isolation voltage	$V_{ISO}$	2	kV $_{rms}$	$t=60\text{sec}$ $f=60\text{Hz}$

\*1  $L=1.52\text{mH}$ ,  $V_{CC}=50\text{V}$ , Starting  $T_{ch}=25^\circ\text{C}$ , See to Avalanche Energy Graph

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

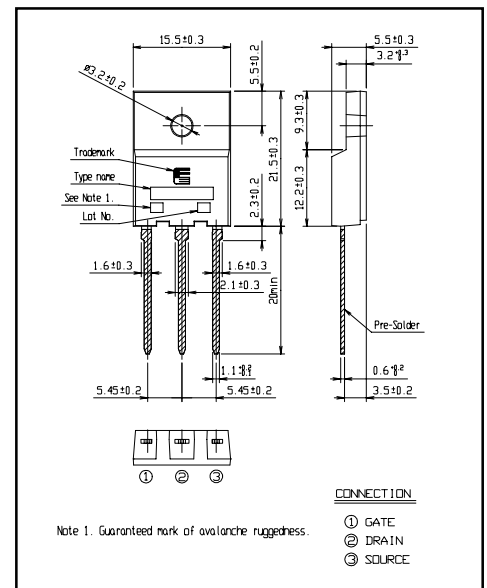
#### Electrical characteristics ( $T_c=25^\circ\text{C}$ unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D=250\mu\text{A}$ $V_{GS}=0\text{V}$	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	$I_{DSS}$	$V_{DS}=500\text{V}$ $V_{GS}=0\text{V}$ $T_{ch}=25^\circ\text{C}$			25	$\mu\text{A}$
		$V_{DS}=400\text{V}$ $V_{GS}=0\text{V}$ $T_{ch}=125^\circ\text{C}$			250	
Gate-source leakage current	$I_{GSS}$	$V_{GS}=\pm 30\text{V}$ $V_{DS}=0\text{V}$		10	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$I_D=7\text{A}$ $V_{GS}=10\text{V}$		0.35	0.46	$\Omega$
Forward transconductance	$g_{fs}$	$I_D=7\text{A}$ $V_{DS}=25\text{V}$	7	14		S
Input capacitance	$C_{iss}$	$V_{DS}=25\text{V}$		1600	2400	pF
Output capacitance	$C_{oss}$	$V_{GS}=0\text{V}$		160	240	
Reverse transfer capacitance	$C_{rss}$	$f=1\text{MHz}$		7	10.5	
Turn-on time $t_{on}$	$t_{d(on)}$	$V_{CC}=300\text{V}$ $I_D=7\text{A}$		18	27	ns
	$t_r$	$V_{GS}=10\text{V}$		16	24	
Turn-off time $t_{off}$	$t_{d(off)}$	$R_{GS}=10\Omega$		35	50	
	$t_f$			8	15	
Total Gate Charge	$Q_G$	$V_{CC}=250\text{V}$		33	50	nC
Gate-Source Charge	$Q_{GS}$	$I_D=14\text{A}$		12.5	19	
Gate-Drain Charge	$Q_{GD}$	$V_{GS}=10\text{V}$		10.5	16	
Avalanche capability	$I_{AV}$	$L=1.52\text{mH}$ $T_{ch}=25^\circ\text{C}$	16			A
Diode forward on-voltage	$V_{SD}$	$I_F=14\text{A}$ $V_{GS}=0\text{V}$ $T_{ch}=25^\circ\text{C}$		1.00	1.50	V
Reverse recovery time	$t_{rr}$	$I_F=14\text{A}$ $V_{GS}=0\text{V}$		0.65		$\mu\text{s}$
Reverse recovery charge	$Q_{rr}$	$-di/dt=100\text{A}/\mu\text{s}$ $T_{ch}=25^\circ\text{C}$		6.0		$\mu\text{C}$

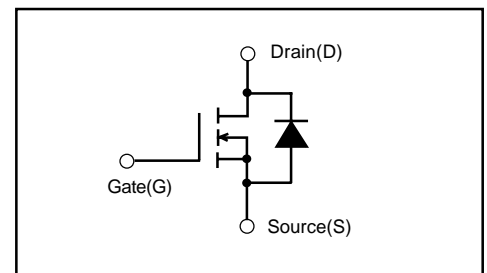
#### Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-c)}$	channel to case			1.32	$^\circ\text{C}/\text{W}$
	$R_{th(ch-a)}$	channel to ambient			2.00	$^\circ\text{C}/\text{W}$

#### Outline Drawings [mm]



#### Equivalent circuit schematic



## Characteristics

