

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}	250	V
	$V_{DSX} *5$	220	V
Continuous drain current	I_D	± 14	A
Pulsed drain current	$I_{D(puls)}$	± 56	A
Gate-source voltage	V_{GS}	± 30	V
Non-repetitive Avalanche current	$I_{AS} *2$	14	A
Maximum Avalanche Energy	$E_{AS} *1$	129.1	mJ
Maximum Drain-Source dV/dt	$dV_{DS}/dt *4$	20	kV/ μs
Peak Diode Recovery dV/dt	$dV/dt *3$	5	kV/ μs
Max. power dissipation	P_D	$T_a=25^\circ\text{C}$	2.16
		$T_c=25^\circ\text{C}$	37
Operating and storage temperature range	T_{ch}	+150	$^\circ\text{C}$
	T_{stg}	-55 to +150	$^\circ\text{C}$
Isolation voltage	V_{ISO}	2	kVrms

*1 $L=1.11\text{mH}$, $V_{CC}=48\text{V}$, $T_{ch}=25^\circ\text{C}$, 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 $V_{DS} \leq 250\text{V}$ *5 $V_{GS} = -30\text{V}$ *6 $t=60\text{sec}$ $f=60\text{Hz}$

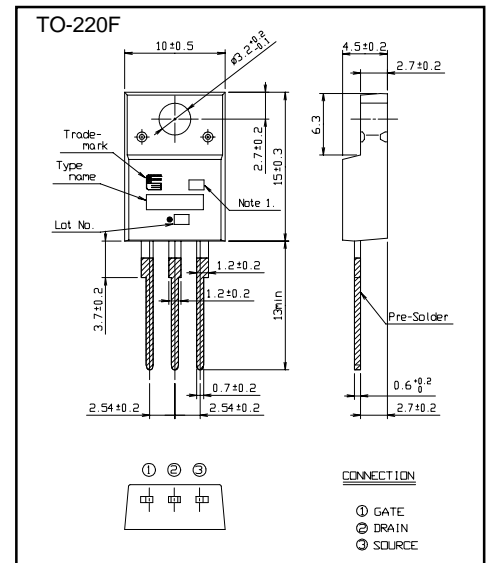
Electrical characteristics ($T_c = 25^\circ\text{C}$ unless otherwise specified)

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	μA
		$V_{DS} = 200\text{V}$ $V_{GS} = 0\text{V}$			250	μA
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	$R_{DS(on)}$	$I_D = 5\text{A}$ $V_{GS} = 10\text{V}$		200	260	$\text{m}\Omega$
Forward transconductance	g_{fs}	$I_D = 5\text{A}$ $V_{DS} = 25\text{V}$	5	10		S
Input capacitance	C_{iss}	$V_{DS} = 75\text{V}$		785	1178	pF
Output capacitance	C_{oss}	$V_{GS} = 0\text{V}$		88	132	pF
Reverse transfer capacitance	C_{rss}	$f = 1\text{MHz}$		4	6	pF
Turn-on time t_{on}	$t_{d(on)}$	$V_{CC} = 48\text{V}$ $I_D = 5\text{A}$		12	18	ns
	t_r	$V_{GS} = 10\text{V}$		2.7	4.1	ns
Turn-off time t_{off}	$t_{d(off)}$	$R_{GS} = 10\Omega$		22	33	ns
	t_f			7.4	11.1	ns
Total Gate Charge	Q_G	$V_{CC} = 125\text{V}$		21	31.5	nC
Gate-Source Charge	Q_{GS}	$I_D = 10\text{A}$		8	12	nC
Gate-Drain Charge	Q_{GD}	$V_{GS} = 10\text{V}$		5	7.5	nC
Avalanche capability	I_{AV}	$L = 1.11\text{mH}$ $T_{ch} = 25^\circ\text{C}$	14			A
Diode forward on-voltage	V_{SD}	$I_F = 10\text{A}$ $V_{GS} = 0\text{V}$ $T_{ch} = 25^\circ\text{C}$		1.10	1.65	V
Reverse recovery time	t_{rr}	$I_F = 10\text{A}$ $V_{GS} = 0\text{V}$		0.155		μs
Reverse recovery charge	Q_{rr}	$-di/dt = 100\text{A}/\mu\text{s}$ $T_{ch} = 25^\circ\text{C}$		1.05		μC

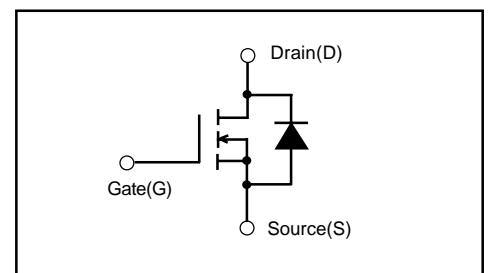
Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-c)}$	channel to case			3.378	$^\circ\text{C}/\text{W}$
	$R_{th(ch-a)}$	channel to ambient			58.0	$^\circ\text{C}/\text{W}$

Outline Drawings (mm)



Equivalent circuit schematic



Characteristics

