

## 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

(Tc=25°C unless otherwise specified)

Item	Symbol	Ratings	Unit
Drain-source voltage	V <sub>DS</sub>	300	V
	V <sub>DSX</sub> *5	270	V
Continuous drain current	I <sub>D</sub>	±12	A
Pulsed drain current	I <sub>D(puls)</sub>	±48	A
Gate-source voltage	V <sub>GS</sub>	±30	V
Repetitive or non-repetitive	I <sub>AR</sub> *2	12	A
Maximum Avalanche Energy	E <sub>AS</sub> *1	193	mJ
Maximum Drain-Source dV/dt	dV <sub>DS</sub> /dt *4	20	kV/μs
Peak Diode Recovery dV/dt	dV/dt *3	5	kV/μs
Max. power dissipation	P <sub>D</sub>	T <sub>a</sub> =25°C	2.16
		T <sub>c</sub> =25°C	35
Operating and storage temperature range	T <sub>ch</sub>	+150	°C
	T <sub>stg</sub>	-55 to +150	°C
Isolation Voltage	V <sub>ISO</sub> *6	2	kVrms

\*1 L=2.32mH, V<sub>CC</sub>=48V \*2 T<sub>ch</sub>≤150°C \*3 I<sub>F</sub>≤-I<sub>D</sub>, -di/dt=50A/μs, V<sub>CC</sub>≤BV<sub>DSS</sub>, T<sub>ch</sub>≤150°C

\*4 V<sub>DS</sub>≤300V \*5 V<sub>GS</sub>=-30V \*6 t=60sec f=60Hz

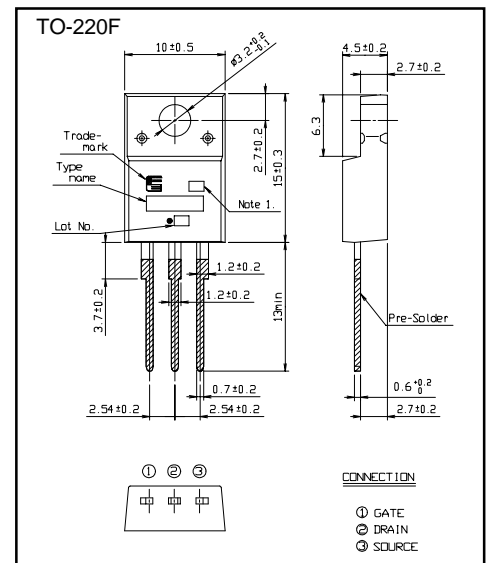
### Electrical characteristics (T<sub>c</sub> =25°C unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> =250μA V <sub>GS</sub> =0V	300			V
Gate threshold voltage	V <sub>GS(th)</sub>	I <sub>D</sub> = 250μA V <sub>DS</sub> =V <sub>GS</sub>	3.5		4.5	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =300V V <sub>GS</sub> =0V	T <sub>ch</sub> =25°C		25	μA
			T <sub>ch</sub> =125°C		250	
Gate-source leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±30V V <sub>DS</sub> =0V		10	100	nA
Drain-source on-state resistance	R <sub>DS(on)</sub>	I <sub>D</sub> =6A V <sub>GS</sub> =10V		1.22	0.28	Ω
Forward transconductance	g <sub>fs</sub>	I <sub>D</sub> =6A V <sub>DS</sub> =25V	5	10.5		S
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V V <sub>GS</sub> =0V f=1MHz		980	1470	pF
Output capacitance	C <sub>oss</sub>			170	255	
Reverse transfer capacitance	C <sub>rss</sub>			5.5	11	
Turn-on time t <sub>on</sub>	t <sub>d(on)</sub>	V <sub>CC</sub> =150V I <sub>D</sub> =6A V <sub>GS</sub> =10V		14.5	29	ns
			t <sub>r</sub>		6.5	
Turn-off time t <sub>off</sub>	t <sub>d(off)</sub>	R <sub>GS</sub> =10 Ω		28	42	
			t <sub>f</sub>		4	
Total Gate Charge	Q <sub>G</sub>	V <sub>CC</sub> =150V		23	34.5	nC
Gate-Source Charge	Q <sub>GS</sub>	I <sub>D</sub> =12A		9.7	14.6	
Gate-Drain Charge	Q <sub>GD</sub>	V <sub>GS</sub> =10V		5.6	11.2	
Avalanche capability	I <sub>AV</sub>	L=100μH T <sub>ch</sub> =25°C	12			A
Diode forward on-voltage	V <sub>SD</sub>	I <sub>F</sub> =12A V <sub>GS</sub> =0V T <sub>ch</sub> =25°C		1.20	1.80	V
Reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> =12A V <sub>GS</sub> =0V		0.2		μs
Reverse recovery charge	Q <sub>rr</sub>	-di/dt=100A/μs T <sub>ch</sub> =25°C		1.80		μC

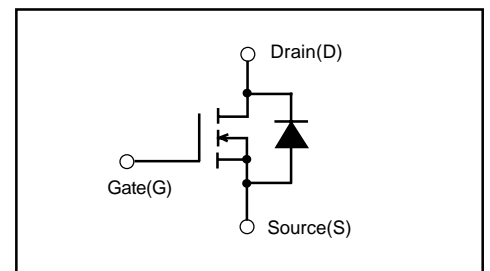
### Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	R <sub>th(ch-c)</sub>	channel to case			3.57	°C/W
	R <sub>th(ch-a)</sub>	channel to ambient			58.0	°C/W

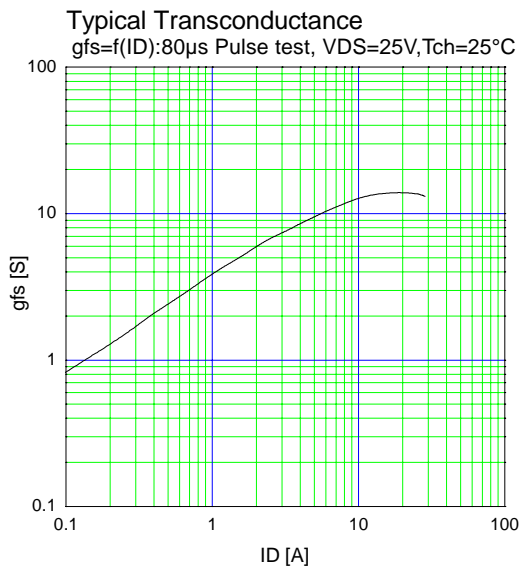
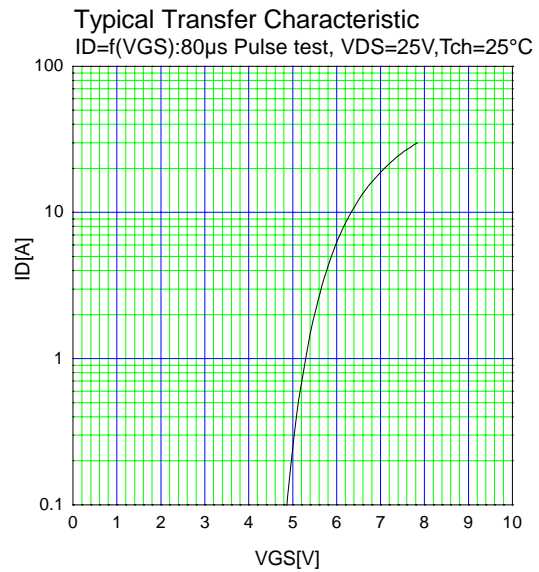
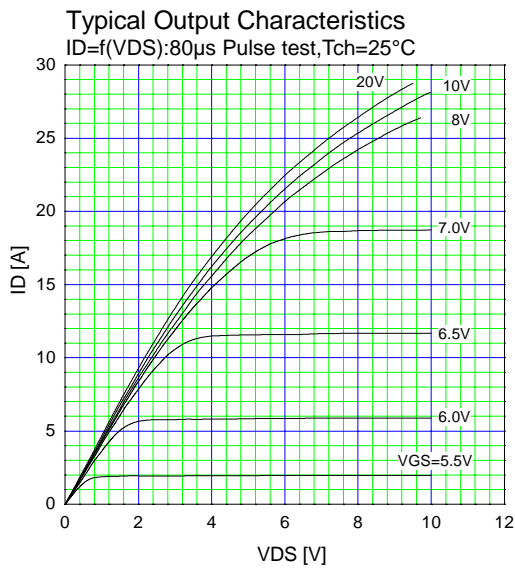
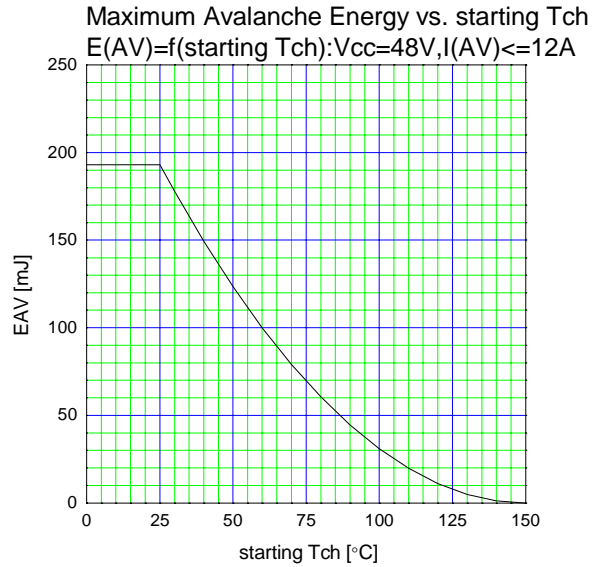
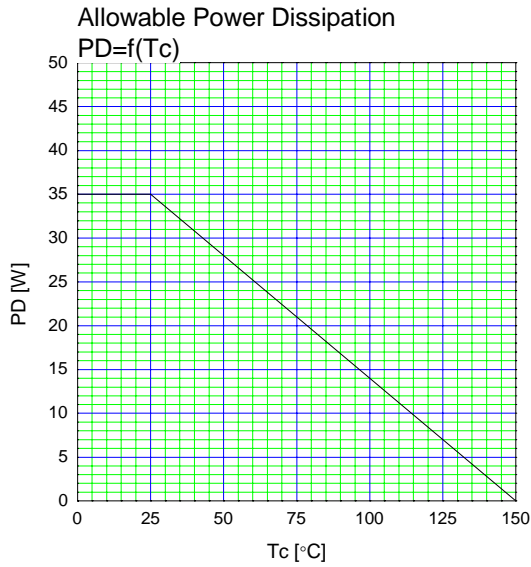
### Outline Drawings



### Equivalent circuit schematic



Characteristics



$R_{DS(on)}=f(I_D): 80\mu s \text{ Pulse test, } T_{ch}=25^\circ C$

RDS(on) [Ω]

