

## Super FAP-G Series

## N-CHANNEL SILICON POWER MOSFET

### ■ Features

- High speed switching
- No secondary breakdown
- Avalanche-proof
- Low on-resistance
- Low driving power

### ■ Applications

- Switching regulators
- DC-DC converters
- UPS (Uninterruptible Power Supply)

### ■ Maximum ratings and characteristic Absolute maximum ratings ● (Tc=25°C unless otherwise specified)

Item	Symbol	Ratings	Unit	Remarks
Drain-source voltage	V <sub>DS</sub>	250	V	
	V <sub>DSX</sub>	220	V	V <sub>GS</sub> =-30V
Continuous drain current	I <sub>D</sub>	14	A	
Pulsed drain current	I <sub>D(puls)</sub>	±56	A	
Gate-source voltage	V <sub>GS</sub>	±30	V	
Repetitive or non-repetitive	I <sub>AR</sub>	14	A	Note *1
Non-repetitive Maximum avalanche energy	E <sub>AS</sub>	301.1	mJ	Note *2
Repetitive Maximum avalanche energy		3.7	mJ	Note *3
Maximum drain-source dV/dt	dV <sub>DS</sub> /dt	20	kV/μs	V <sub>DS</sub> ≤ 250V
Peak diode recovery dV/dt	dV/dt	5	kV/μs	Note *4
Peak diode recovery -di/dt	-di/dt	100	A/μs	Note *5
Max. power dissipation	P <sub>d</sub>	2.16	W	T <sub>a</sub> =25°C
		37	W	T <sub>c</sub> =25°C
Operating and storage temperature range	T <sub>ch</sub> T <sub>stg</sub>	+150 -55 to +150	°C	
Isolation voltage	V <sub>ISO</sub> *6	2	kVrms	t=60sec, f=60Hz

Note \*1 T<sub>ch</sub> ≤ 150°C

Note \*2 Starting T<sub>ch</sub>=25°C, I<sub>AS</sub>=6A, L=14.1mH, V<sub>CC</sub>=48V, R<sub>G</sub>=50Ω  
E<sub>AS</sub> limited by maximum channel temperature and avalanche current.  
See to 'Avalanche Energy' graph.

Note \*3 Repetitive rating : Pulse width limited by maximum channel temperature.  
See to 'Transient Thermal impedance' graph.

Note \*4 I<sub>F</sub> ≤ -I<sub>D</sub>, -di/dt=100A/μs, V<sub>CC</sub> < BV<sub>DSS</sub>, T<sub>ch</sub> ≤ 150°C

Note \*5 I<sub>F</sub> = -I<sub>D</sub>, -di/dt=100A/μs, V<sub>CC</sub> ≤ BV<sub>DSS</sub>, T<sub>ch</sub> ≤ 150°C

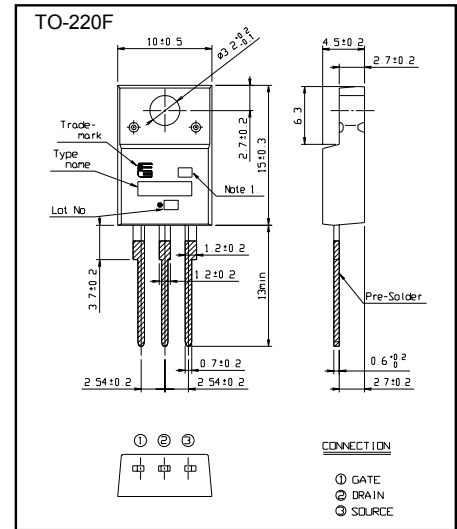
### ● Electrical characteristics (T<sub>c</sub> = 25°C unless otherwise specified)

Item	Symbol	Test Conditions			
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> = 250μA V <sub>GS</sub> =0V	250		V
Gate threshold voltage	V <sub>GS(th)</sub>	I <sub>D</sub> = 250μA V <sub>DS</sub> =V <sub>GS</sub>	3.0	5.0	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =250V V <sub>GS</sub> =0V T <sub>ch</sub> =25°C		25	μA
		V <sub>DS</sub> =200V V <sub>GS</sub> =0V T <sub>ch</sub> =125°C		2.0	mA
Gate-source leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±30V V <sub>DS</sub> =0V		100	nA
Drain-source on-state resistance	R <sub>DS(on)</sub>	I <sub>D</sub> =7A V <sub>GS</sub> =10V	220	280	mΩ
Forward transconductance	g <sub>fs</sub>	I <sub>D</sub> =7A V <sub>DS</sub> =25V	5	10	S
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =75V	780	1170	pF
Output capacitance	C <sub>oss</sub>	V <sub>GS</sub> =0V	90	135	
Reverse transfer capacitance	C <sub>rss</sub>	f=1MHz	6	9	
Turn-on time t <sub>on</sub>	t <sub>d(on)</sub>	V <sub>CC</sub> =48V I <sub>D</sub> =7A	12	18	ns
	t <sub>r</sub>	V <sub>GS</sub> =10V	3	4.5	
Turn-off time t <sub>off</sub>	t <sub>d(off)</sub>	R <sub>GS</sub> =10Ω	23	35	
	t <sub>f</sub>		6	9	
Total Gate Charge	Q <sub>G</sub>	V <sub>CC</sub> =125V	22	33	nC
Gate-Source Charge	Q <sub>GS</sub>	I <sub>D</sub> =14A	7	11	
Gate-Drain Charge	Q <sub>GD</sub>	V <sub>GS</sub> =10V	6	9	
Diode forward on-voltage	V <sub>SD</sub>	I <sub>F</sub> =14A V <sub>GS</sub> =0V T <sub>ch</sub> =25°C	1.00	1.50	V
Reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> =14A V <sub>GS</sub> =0V	120	250	ns
Reverse recovery charge	Q <sub>rr</sub>	-di/dt=100A/μs T <sub>ch</sub> =25°C	0.5	1.25	μC

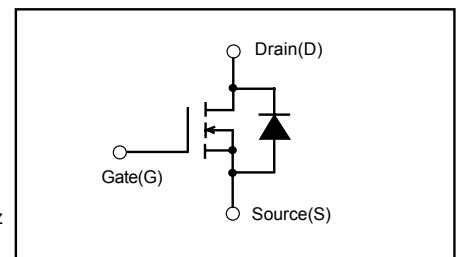
### ● Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	R <sub>th(ch-c)</sub>	channel to case			3.378	°C/W
	R <sub>th(ch-a)</sub>	channel to ambient			58.0	°C/W

### ■ Outline Drawings [mm]



### ■ Equivalent circuit schematic



Characteristics

