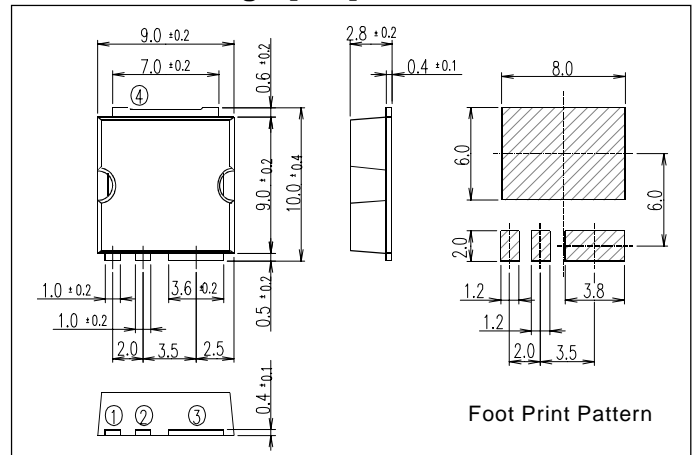


## Super FAP-G Series

## N-CHANNEL SILICON POWER MOSFET

### ■ Outline Drawings [mm]



### ■ Features

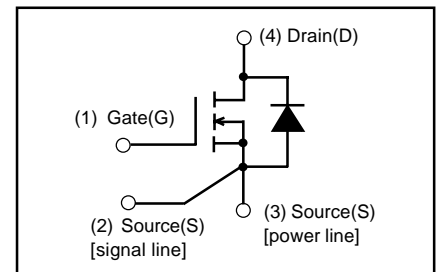
- High speed switching
- Low on-resistance
- No secondary breakdown
- Low driving power
- Avalanche-proof

### ■ Applications for Switching

### ■ Absolute Maximum Ratings at $T_c=25^\circ\text{C}$ ( unless otherwise specified)

Item	Symbol	Ratings	Unit	Remarks
Drain-source voltage	$V_{DS}$	250	V	
	$V_{DSX}$	220	V	$V_{GS}=30\text{V}$
Continuous drain current	$I_D$	$\pm 37$	A	
		$\pm 3.4$ *4	A	$T_a=25^\circ\text{C}$
Pulsed drain current	$I_D(\text{puls})$	$\pm 148$	A	
Gate-source voltage	$V_{GS}$	$\pm 30$	V	
Repetitive or non-repetitive	$I_{AR}$ *2	37	A	
Maximum Avalanche Energy	$E_{AS}$ *1	251.9	mJ	
Maximum Drain-Source dV/dt	$dV_{DS}/dt$	20	kV/ $\mu\text{s}$	$V_{DS} \leq 250\text{V}$
Peak Diode Recovery dV/dt	$dV/dt$ *3	5	kV/ $\mu\text{s}$	
Max. power dissipation	$P_D$	2.4 *4	W	$T_a=25^\circ\text{C}$
		270	W	
Operating and storage temperature range	$T_{ch}$	+150	$^\circ\text{C}$	
	$T_{stg}$	-55 to +150	$^\circ\text{C}$	

### ■ Equivalent circuit schematic



\*1  $L=0.309\text{mH}$ ,  $V_{CC}=48\text{V}$ , See to Avalanche Energy Graph \*2  $T_{ch} \leq 150^\circ\text{C}$  \*3  $I_F \leq -I_D$ ,  $-di/dt=50\text{A}/\mu\text{s}$ ,  $V_{CC} \leq BV_{DS}$ ,  $T_{ch} \leq 150^\circ\text{C}$

\*4 Surface mounted on  $1000\text{mm}^2$ ,  $t=1.6\text{mm}$  FR-4 PCB(Drain pad area:  $500\text{mm}^2$ )

### ● Electrical characteristics at $T_c=25^\circ\text{C}$ ( 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	$I_{DSS}$	$V_{DS}=250\text{V}$ $V_{GS}=0\text{V}$ $T_{ch}=25^\circ\text{C}$			25	$\mu\text{A}$
		$V_{DS}=200\text{V}$ $V_{GS}=0\text{V}$ $T_{ch}=125^\circ\text{C}$			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	$R_{DS(on)}$	$I_D=12.5\text{A}$ $V_{GS}=10\text{V}$		75	100	$\text{m}\Omega$
Forward transconductance	$g_{fs}$	$I_D=12.5\text{A}$ $V_{DS}=25\text{V}$	8	16		S
Input capacitance	$C_{iss}$	$V_{DS}=75\text{V}$		2000	3000	pF
Output capacitance	$C_{oss}$	$V_{GS}=0\text{V}$		220	330	
Reverse transfer capacitance	$C_{rss}$	$f=1\text{MHz}$		15	30	
Turn-on time $t_{on}$	$t_{d(on)}$	$V_{CC}=72\text{V}$ $I_D=12.5\text{A}$		20	30	ns
	$t_r$	$V_{GS}=10\text{V}$		30	45	
Turn-off time $t_{off}$	$t_{d(off)}$	$R_{GS}=10\Omega$		60	90	
	$t_f$			20	30	
Total Gate Charge	$Q_G$	$V_{CC}=72\text{V}$		44	66	nC
Gate-Source Charge	$Q_{GS}$	$I_D=25\text{A}$		14	21	
Gate-Drain Charge	$Q_{GD}$	$V_{GS}=10\text{V}$		16	24	
Avalanche capability	$I_{AV}$	$L=309\mu\text{H}$ $T_{ch}=25^\circ\text{C}$	37			A
Diode forward on-voltage	$V_{SD}$	$I_F=25\text{A}$ $V_{GS}=0\text{V}$ $T_{ch}=25^\circ\text{C}$		1.10	1.65	V
Reverse recovery time	$t_{rr}$	$I_F=25\text{A}$ $V_{GS}=0\text{V}$		0.45		$\mu\text{s}$
Reverse recovery charge	$Q_{rr}$	$-di/dt=100\text{A}/\mu\text{s}$ $T_{ch}=25^\circ\text{C}$		1.5		$\mu\text{C}$

### ● Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-c)}$	channel to case			0.463	$^\circ\text{C}/\text{W}$
	$R_{th(ch-a)}$	channel to ambient			87.0	$^\circ\text{C}/\text{W}$
	$R_{th(ch-a)}$ *4	channel to ambient			52.0	$^\circ\text{C}/\text{W}$

■ Characteristics

