

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 characteristics Absolute maximum ratings

● (Tc=25°C unless otherwise specified)

Item	Symbol	Ratings	Unit
Drain-source voltage	V _{DS}	600	V
Continuous drain current	I _D	±12	A
Pulsed drain current	I _D (puls)	±48	A
Gate-source voltage	V _{GS}	±30	V
Repetitive or non-repetitive	IAR*2	12	A
Maximum Avalanche Energy	EAS*1	183	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	Ta=25°C	2.16
		Tc=25°C	70
Operating and storage temperature range	T _{ch}	+150	°C
	T _{stg}	-55 to +150	°C
Isolation Voltage	V _{ISO} *5	2	kVrms

*1 L=2.33mH, V_{CC}=60V, See to Avalanche Energy Graph *2 T_{ch}≤150°C

*3 I_F≤-I_D, -di/dt=50A/μs, V_{CC}≤BV_{DSS}, T_{ch}≤150°C *4 V_{DS}≤600V *5 t=60sec, f=60Hz

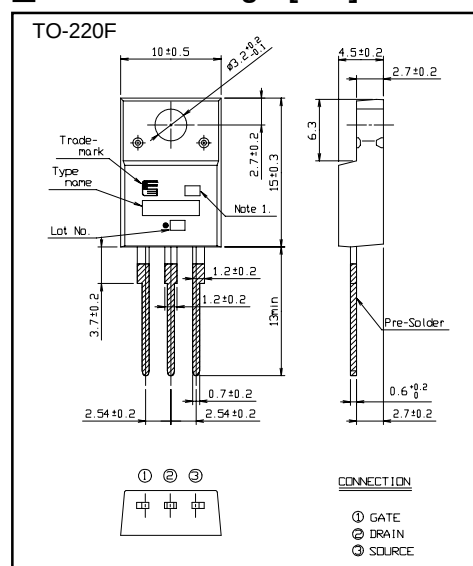
● Electrical characteristics (Tc =25°C unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	V(BR) _{DSS}	I _D =1mA V _{GS} =0V	600			V
Gate threshold voltage	V _{GS(th)}	I _D =250μA V _{DS} =V _{GS}	3.0		5.0	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =600V V _{GS} =0V T _{ch} =25°C			25	μA
		V _{DS} =480V V _{GS} =0V T _{ch} =125°C			250	
Gate-source leakage current	I _{GSS}	V _{GS} =±30V V _{DS} =0V		10	100	nA
Drain-source on-state resistance	R _{DS(on)}	I _D =5A V _{GS} =10V		0.58	0.75	Ω
Forward transconductance	g _{fs}	I _D =5A V _{DS} =25V	4	8		S
Input capacitance	C _{iss}	V _{DS} =25V		1200	1800	pF
Output capacitance	C _{oss}	V _{GS} =0V		140	210	
Reverse transfer capacitance	C _{rss}	f=1MHz		6	9	
Turn-on time t _{on}	td(on)	V _{CC} =300V I _D =5A		17	26	ns
	tr	V _{GS} =10V		15	23	
Turn-off time t _{off}	td(off)	R _{GS} =10Ω		35	53	
	tr			7	11	
Total Gate Charge	Q _G	V _{CC} =250V		30	45	nC
Gate-Source Charge	Q _{GS}	I _D =10A		11	16.5	
Gate-Drain Charge	Q _{GD}	V _{GS} =10V		10	15	
Avalanche capability	I _{AV}	L=2.33mH T _{ch} =25°C	12			
Diode forward on-voltage	V _{SD}	I _F =10A V _{GS} =0V T _{ch} =25°C		1.00	1.50	V
Reverse recovery time	t _{rr}	I _F =10A V _{GS} =0V		0.75		μs
Reverse recovery charge	Q _{rr}	-di/dt=100A/μs T _{ch} =25°C		5.0		μC

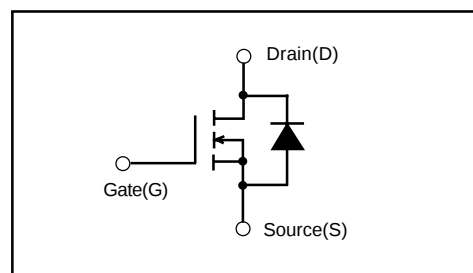
● Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	R _{th(ch-c)}	channel to case			1.79	°C/W
	R _{th(ch-a)}	channel to ambient			58.0	°C/W

■ Outline Drawings [mm]

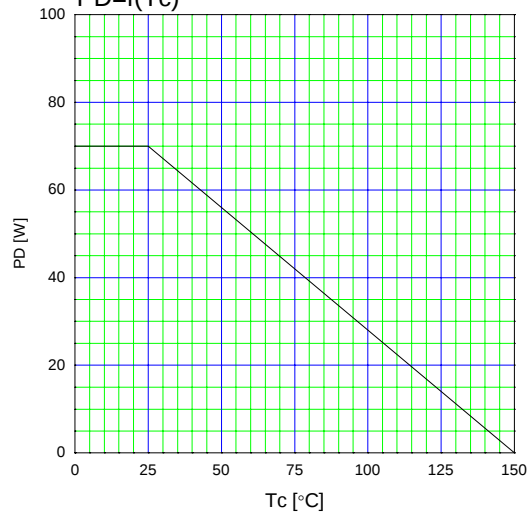


■ Equivalent circuit schematic

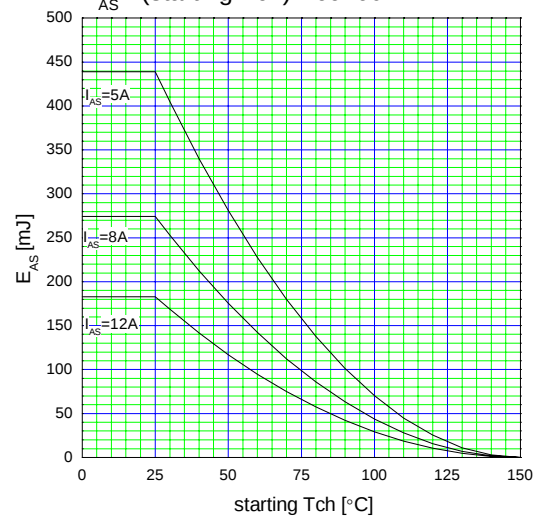


■ Characteristics

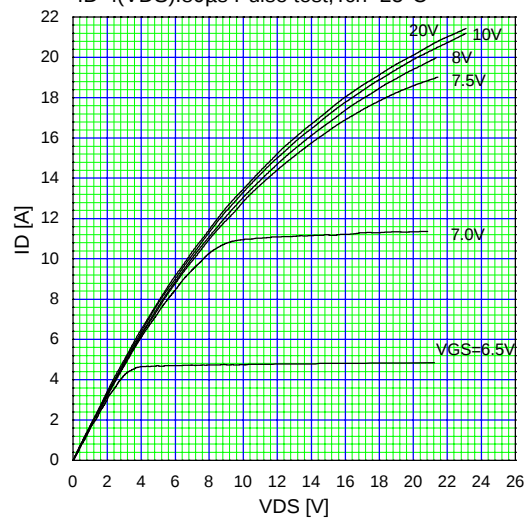
Allowable Power Dissipation
 $PD=f(T_c)$



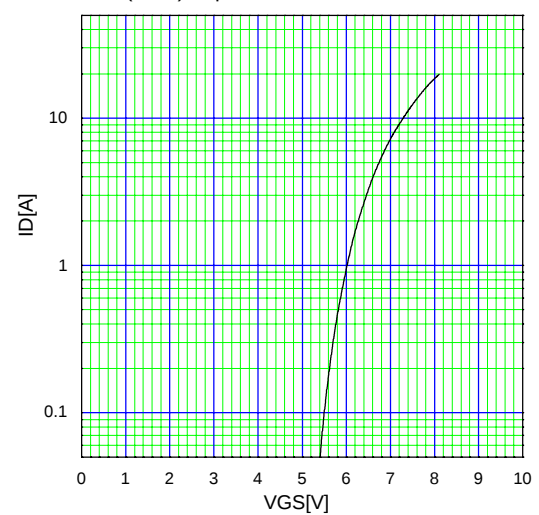
Maximum Avalanche Energy vs. starting T_{ch}
 $E_{AS}=f(\text{starting } T_{ch}): V_{CC}=60V$



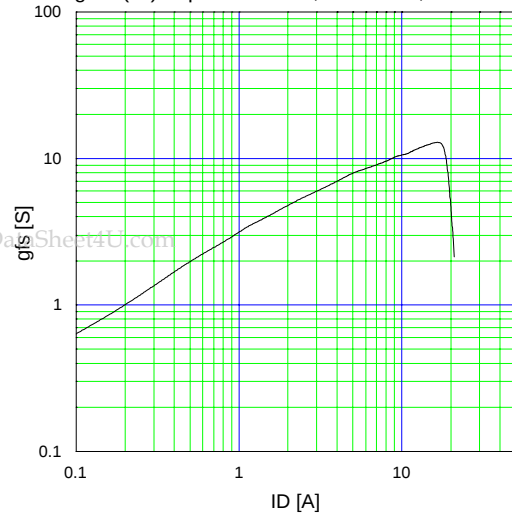
Typical Output Characteristics
 $ID=f(V_{DS}): 80\mu s \text{ Pulse test, } T_{ch}=25^\circ C$



Typical Transfer Characteristic
 $ID=f(V_{GS}): 80\mu s \text{ Pulse test, } V_{DS}=25V, T_{ch}=25^\circ C$



Typical Transconductance
 $g_{fs}=f(ID): 80\mu s \text{ Pulse test, } V_{DS}=25V, T_{ch}=25^\circ C$



Typical Drain-Source on-state Resistance
 $R_{DS(on)}=f(ID): 80\mu s \text{ Pulse test, } T_{ch}=25^\circ C$

