

Super FAP-G Series

N-CHANNEL SILICON POWER MOSFET

Features

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

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	Remarks
Drain-source voltage	V _{DS}	900	V	
	V _{DSX}	900	V	V _{GS} =-30V
Continuous drain current	I _D	2.6	A	
Pulsed drain current	I _{D(puls)}	±10.4	A	
Gate-source voltage	V _{GS}	±30	V	
Repetitive or non-repetitive	I _{AR}	2.6	A	Note *1
Non-repetitive Maximum avalanche energy	E _{AS}	349.1	mJ	Note *2
Repetitive Maximum avalanche energy	E _{AR}	9.0	mJ	Note *3
Maximum drain-source dV/dt	dV _{DS} /dt	40	kV/μs	V _{DS} ≤ 900V
Peak diode recovery dV/dt	dV/dt	5	kV/μs	Note *4
Maximum power dissipation	P _D	90	W	T _c =25°C
		2.02	W	T _a =25°C
Operating and storage temperature range	T _{ch}	+150	°C	
	T _{stg}	-55 to +150	°C	

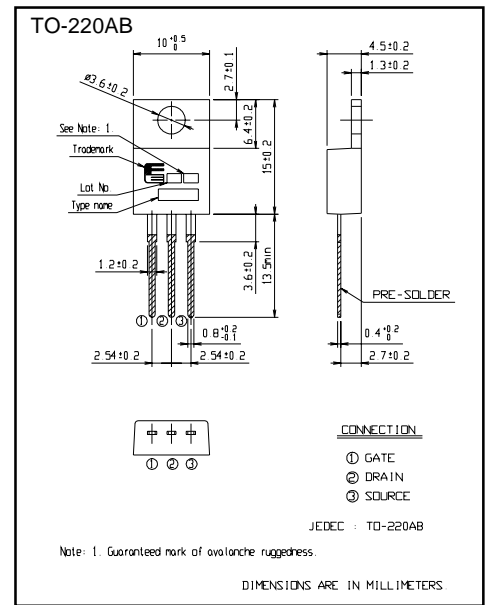
Note *1 T_{ch} ≤ 150°C

Note *2 Starting T_{ch}=25°C, I_{AS}=1.1A, L=524mH, V_{CC}=100V, R_G=50Ω
E_{AS} limited by maximum channel temperature and avalanche current.
See to 'Avalanche Energy' graph.

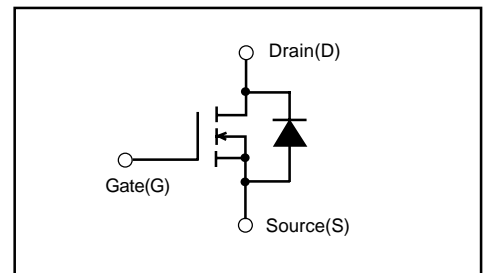
Note *3 Repetitive rating : Pulse width limited by maximum channel temperature.
See to 'Transient Thermal impedance' graph.

Note *4 I_F ≤ -I_D, -di/dt=50A/μs, V_{CC} ≤ BV_{DSS}, T_{ch} ≤ 150°C

Outline Drawings [mm]



Equivalent circuit schematic



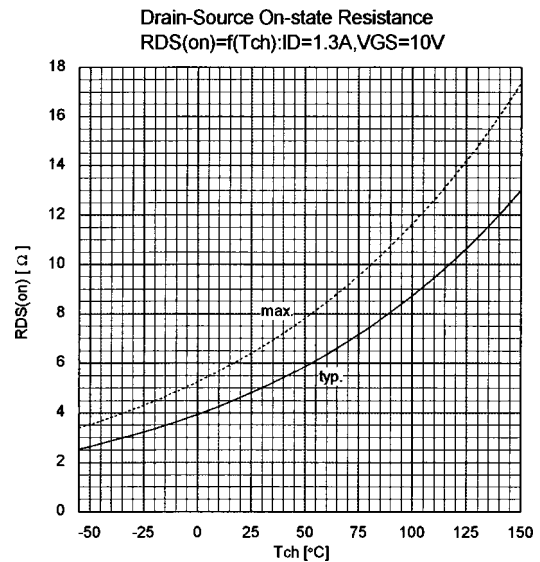
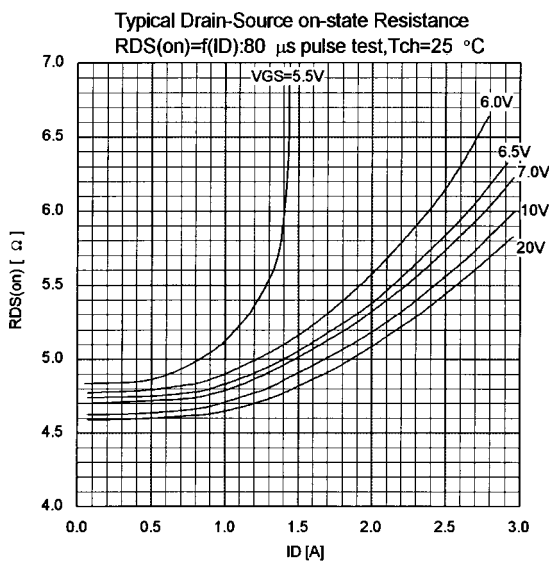
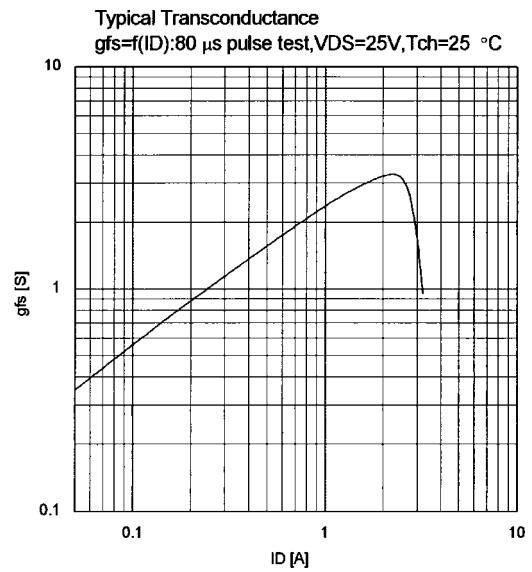
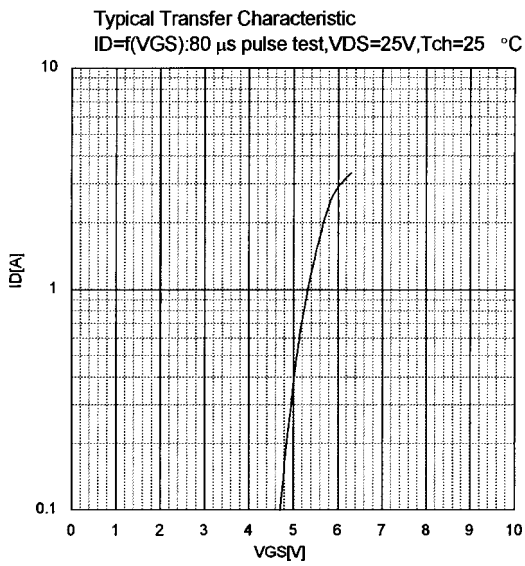
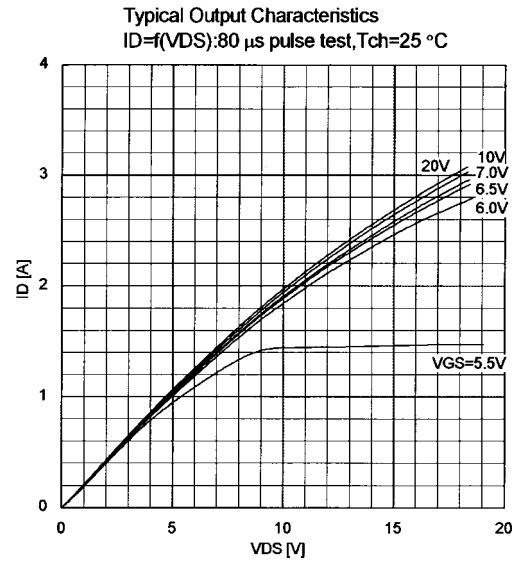
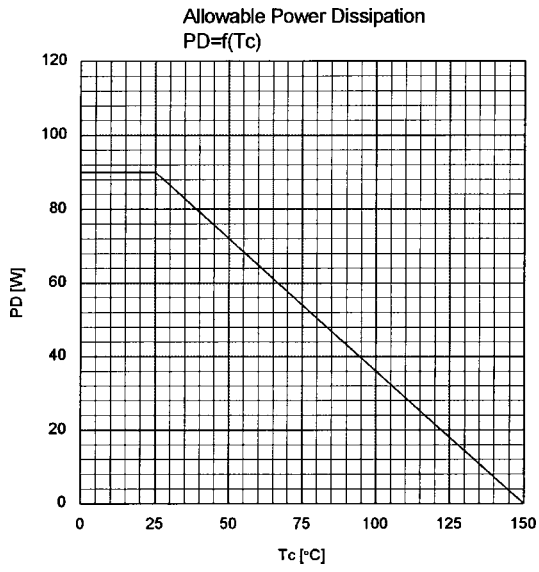
Electrical characteristics (Tc = 25°C unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	BV _{DSS}	I _D =250μA V _{GS} =0V	900			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} =900V V _{GS} =0V T _{ch} =25°C			25	μA
		V _{DS} =720V V _{GS} =0V T _{ch} =125°C			250	
Gate-source leakage current	I _{GSS}	V _{GS} =±30V V _{DS} =0V			100	nA
Drain-source on-state resistance	R _{DS(on)}	I _D =1.3A V _{GS} =10V		4.8	6.4	Ω
Forward transconductance	g _{fs}	I _D =1.3A V _{DS} =25V	1.3	2.6		S
Input capacitance	C _{iss}	V _{DS} =25V		330	495	pF
Output capacitance	C _{oss}	V _{GS} =0V		44	66	
Reverse transfer capacitance	C _{rss}	f=1MHz		2.5	5.0	
Turn-on time t _{on}	td(on)	V _{CC} =600V I _D =1.3A		10.5	15.8	ns
	t _r	V _{GS} =10V		6.5	9.8	
Turn-off time t _{off}	td(off)	R _G =10 Ω		28	42	
	t _r			20	30	
Total Gate Charge	Q _G	V _{CC} =450V		13	19.5	nC
Gate-Source Charge	Q _{GS}	I _D =2.6A		4.5	6.5	
Gate-Drain Charge	Q _{GD}	V _{GS} =10V		4.3	6.8	
Diode forward on-voltage	V _{SD}	I _F =2.6A V _{GS} =0V T _{ch} =25°C		1.00	1.50	V
Reverse recovery time	t _{rr}	I _F =2.6A V _{GS} =0V		1.5		μs
Reverse recovery charge	Q _{rr}	-di/dt=100A/μs T _{ch} =25°C		4.0		μC

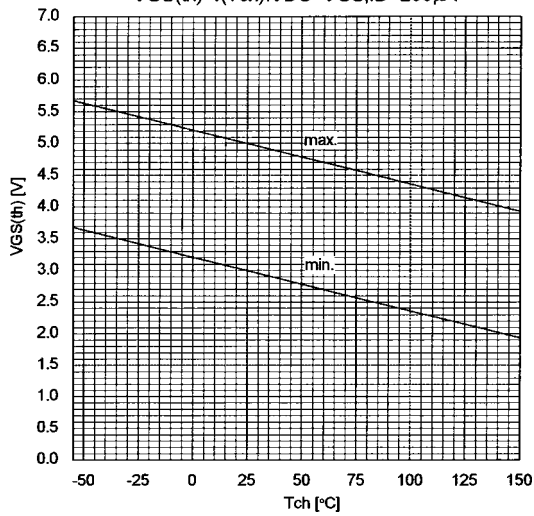
Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	R _{th(ch-c)}	channel to case			1.389	°C/W
	R _{th(ch-a)}	channel to ambient			62.0	°C/W

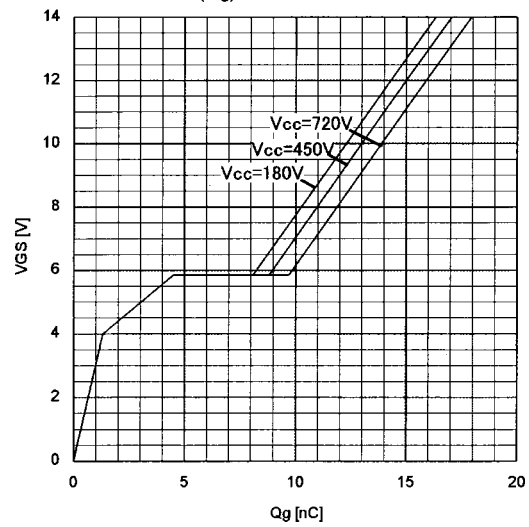
Characteristics



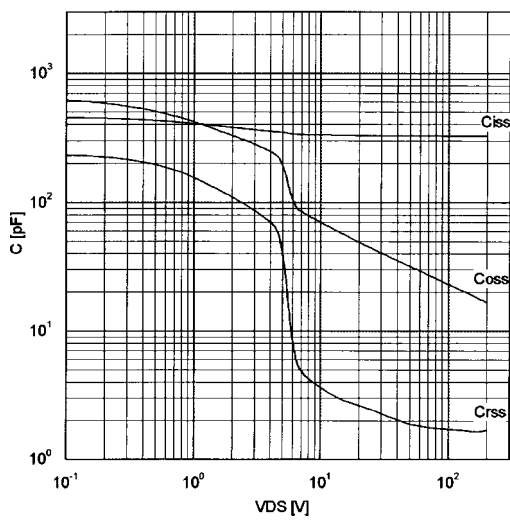
Gate Threshold Voltage vs. Tch
 $V_{GS(th)}=f(T_{ch}):V_{DS}=V_{GS},I_D=250\mu A$



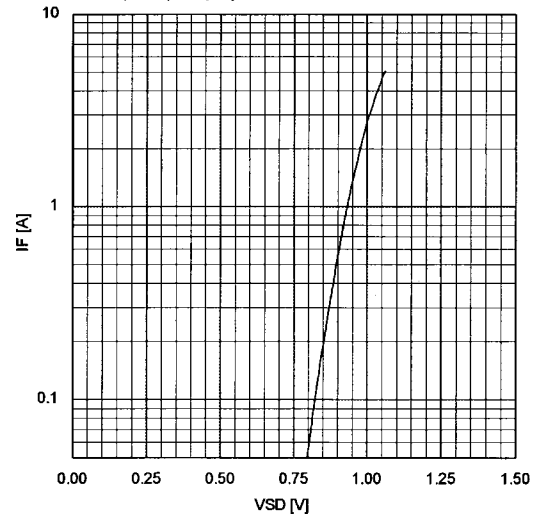
Typical Gate Charge Characteristics
 $V_{GS}=f(Q_g):I_D=2.6A,T_{ch}=25\text{ }^\circ C$



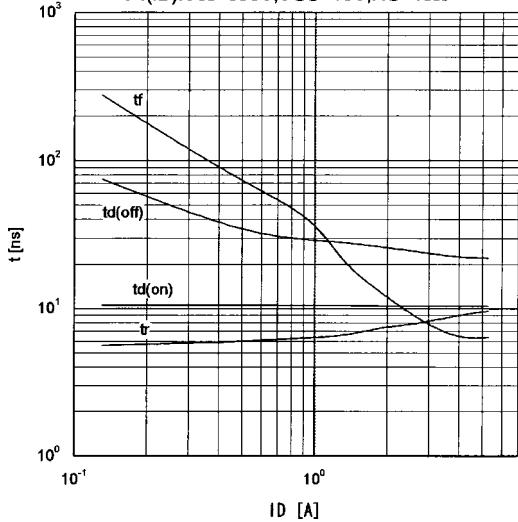
Typical Capacitance
 $C=f(V_{DS}):V_{GS}=0V,f=1MHz$



Typical Forward Characteristics of Reverse Diode
 $I_F=f(V_{SD}):80\mu s\text{ pulse test},T_{ch}=25\text{ }^\circ C$



Typical Switching Characteristics vs. ID
 $t=f(I_D):V_{cc}=600V,V_{GS}=10V,R_G=10\Omega$



Maximum Avalanche Energy vs. starting Tch
 $E_{(AV)}=f(\text{starting } T_{ch}):V_{cc}=100V,I_{(AV)}\le 2.6A$

