

Super FAP-G Series

■ 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

● (T_c=25°C unless otherwise specified)

Item	Symbol	Ratings	Unit
Drain-source voltage	V _{DS}	600	V
	V _{DSX} *5	600	V
Continuous drain current	I _D	±17	A
Pulsed drain current	I _{D(puls)}	±68	A
Gate-source voltage	V _{GS}	±30	V
Repetitive or non-repetitive	I _{AR} *2	17	A
Maximum Avalanche Energy	E _{AS} *1	412	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	T _a =25°C	2.50
		T _c =25°C	220
Operating and storage temperature range	T _{ch}	+150	°C
	T _{stg}	-55 to +150	°C

*1 L=2.62mH, V_{CC}=60V *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 V_{GS}=-30V

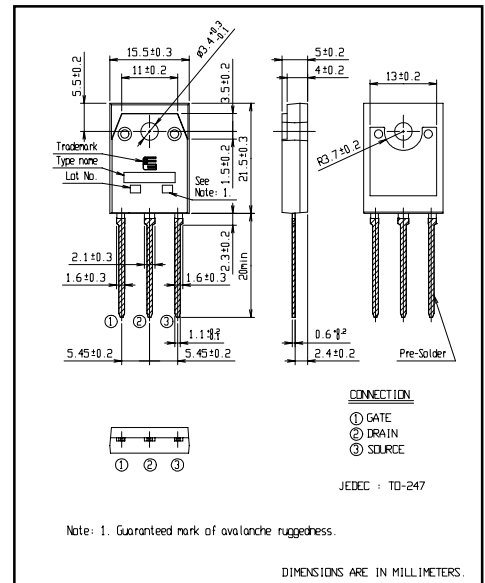
● Electrical characteristics (T_c =25°C unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	V _{(BR)DSS}	I _D =250μA 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			25	μA
		V _{DS} =480V V _{GS} =0V			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 =8.5A V _{GS} =10V		0.29	0.37	Ω
Forward transconductance	g _{fs}	I _D =8.5A V _{DS} =25V	10	20		S
Input capacitance	C _{iss}	V _{DS} =25V		2280	3420	pF
Output capacitance	C _{oss}	V _{GS} =0V		290	435	
Reverse transfer capacitance	C _{rss}	f=1MHz		16	24	
Turn-on time t _{on}	td(on)	V _{CC} =300V I _D =8.5A		26	39	ns
	t _r	V _{GS} =10V		37	56	
Turn-off time t _{off}	td(off)	R _{GS} =10 Ω		78	117	
	t _f			13	19	
Total Gate Charge	Q _G	V _{CC} =300V		54	81	nC
Gate-Source Charge	Q _{GS}	I _D =17A		15	23	
Gate-Drain Charge	Q _{GD}	V _{GS} =10V		20	30	
Avalanche capability	I _{AV}	L=2.62mH T _{ch} =25°C	17			A
Diode forward on-voltage	V _{SD}	I _F =17A V _{GS} =0V T _{ch} =25°C		0.93	1.50	V
Reverse recovery time	t _{rr}	I _F =17A V _{GS} =0V		0.7		μs
Reverse recovery charge	Q _{rr}	-di/dt=100A/μs T _{ch} =25°C		10.0		μC

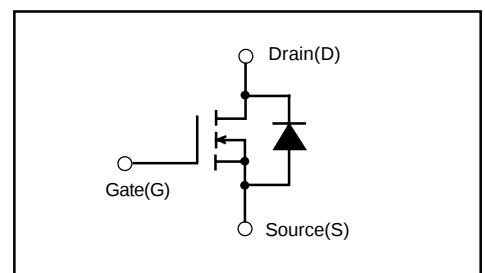
● Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	R _{th(ch-c)}	channel to case			0.568	°C/W
	R _{th(ch-a)}	channel to ambient			50.0	°C/W

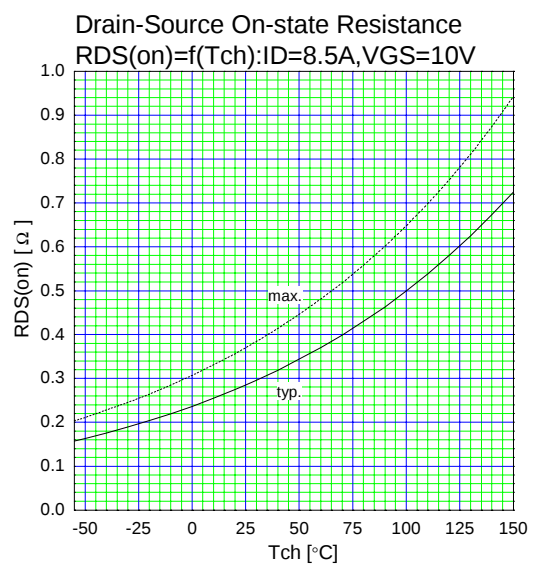
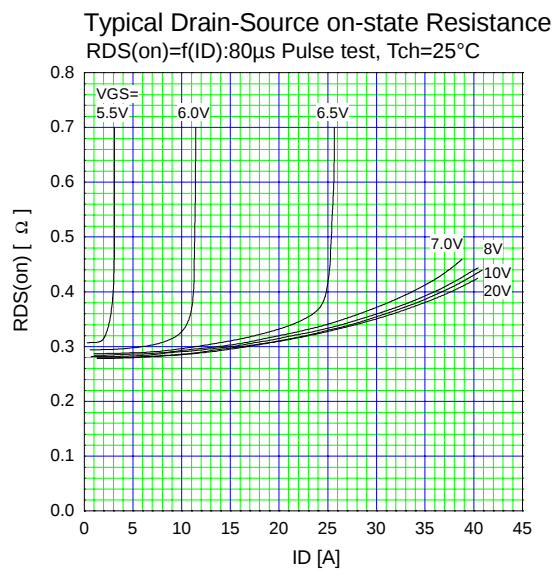
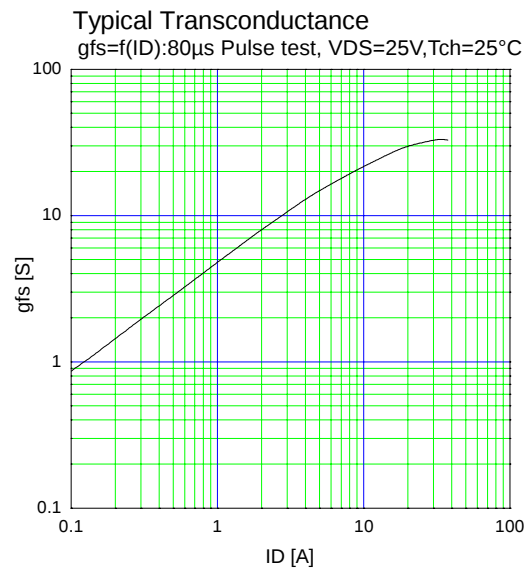
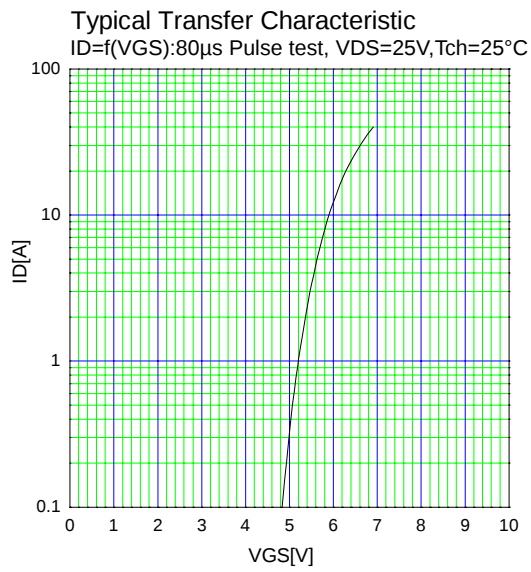
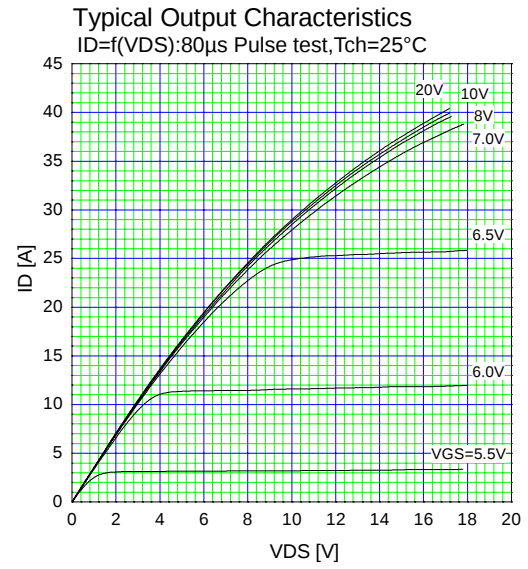
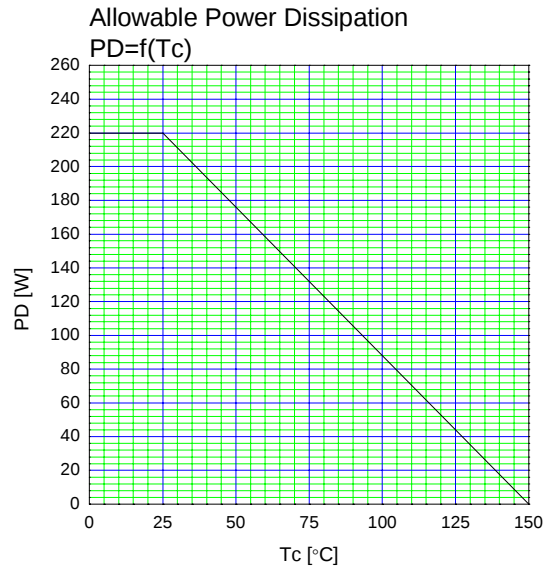
■ Outline Drawings



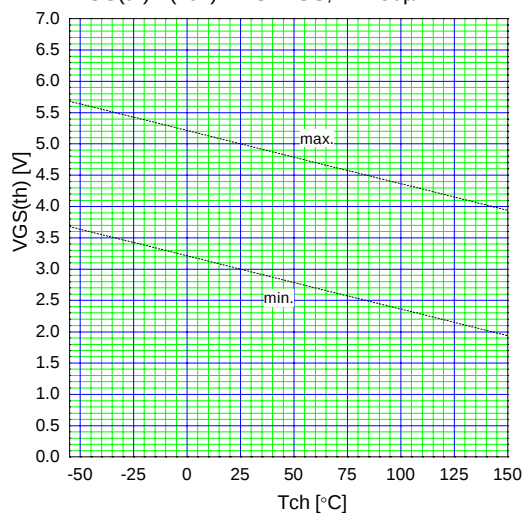
■ Equivalent circuit schematic



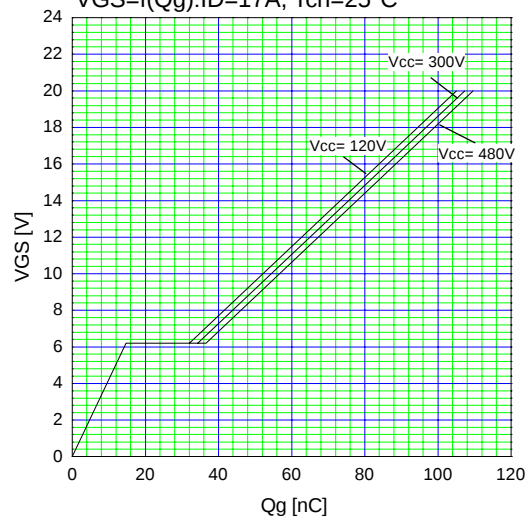
■ Characteristics



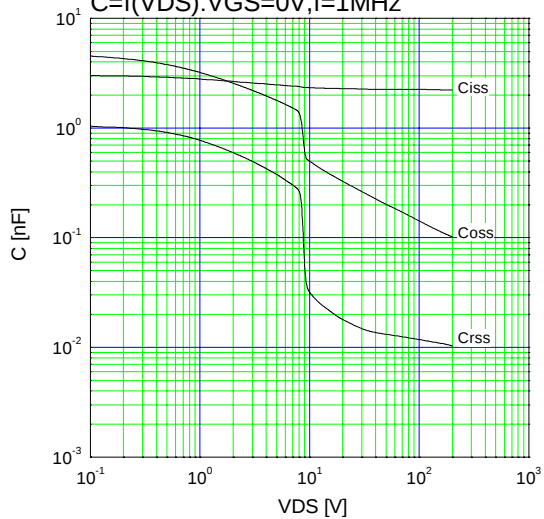
Gate Threshold Voltage vs. T_{ch}
 $V_{GS(th)} = f(T_{ch})$: $V_{DS} = V_{GS}$, $I_D = 250\mu A$



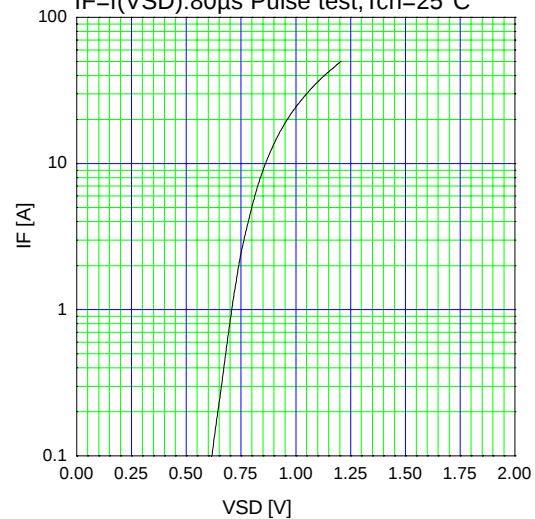
Typical Gate Charge Characteristics
 $V_{GS} = f(Q_g)$: $I_D = 17A$, $T_{ch} = 25^\circ C$



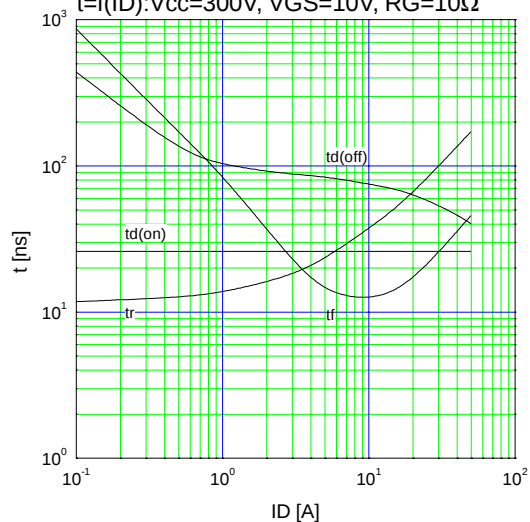
Typical Capacitance
 $C = f(V_{DS})$: $V_{GS} = 0V$, $f = 1MHz$



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



Typical Switching Characteristics vs. I_D
 $t = f(I_D)$: $V_{CC} = 300V$, $V_{GS} = 10V$, $R_G = 10\Omega$



Maximum Avalanche Energy vs. starting T_{ch}
 $E(AV) = f(\text{starting } T_{ch})$: $V_{CC} = 60V$, $I(AV) \leq 17A$

