

FUJI POWER MOSFET

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 characteristic Absolute maximum ratings

● (T_c=25°C unless otherwise specified)

Item	Symbol	Ratings	Unit
Drain-source voltage	V _{DS}	100	V
	V _{DSX} *5	70	V
Continuous drain current	I _D	±29	A
Pulsed drain current	I _D (puls)	±116	A
Gate-source voltage	V _{GS}	±30	V
Non-repetitive Avalanche current	I _{AS} *2	29	A
Maximum Avalanche Energy	E _{AS} *1	155.8	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	2.02
		T _c =25°C	105
Operating and storage temperature range	T _{ch}	+150	°C
	T _{stg}	-55 to +150	°C

*1 L=222μH, V_{CC}=48V, T_{ch}=25°C, 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} ≤ 100V *5 V_{GS}=-30V

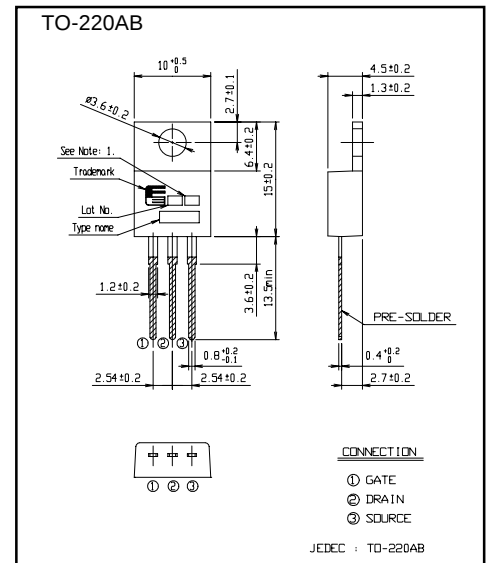
● Electrical characteristics (T_c=25°C unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	V _{(BR)DSS}	I _D =250μA V _{GS} =0V	100			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} =100V V _{GS} =0V			25	μA
		V _{DS} =80V V _{GS} =0V			250	μA
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 =10A V _{GS} =10V		47	62	mΩ
Forward transconductance	g _{fs}	I _D =10A V _{DS} =25V	6	12		S
Input capacitance	C _{iss}	V _{DS} =75V		730	1095	pF
Output capacitance	C _{oss}	V _{GS} =0V		190	285	pF
Reverse transfer capacitance	C _{rss}	f=1MHz		12	18	pF
Turn-on time t _{on}	td(on)	V _{CC} =48V I _D =10A		12	18	ns
	t _r	V _{GS} =10V		3.8	6	ns
Turn-off time t _{off}	td(off)	R _{GS} =10 Ω		23	35	ns
	t _f			8.5	13	ns
Total Gate Charge	Q _G	V _{CC} =50V		22	33	nC
Gate-Source Charge	Q _{GS}	I _D =20A		9	13.5	nC
Gate-Drain Charge	Q _{GD}	V _{GS} =10V		6	9	nC
Avalanche capability	I _{AV}	L=222μH T _{ch} =25°C	29			A
Diode forward on-voltage	V _{SD}	I _F =20A V _{GS} =0V T _{ch} =25°C		1.10	1.65	V
Reverse recovery time	t _{rr}	I _F =20A V _{GS} =0V		65		ns
Reverse recovery charge	Q _{rr}	-di/dt=100A/μs T _{ch} =25°C		0.17		μC

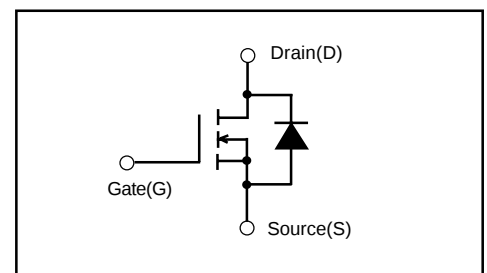
● Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	R _{th(ch-c)}	channel to case			1.191	°C/W
	R _{th(ch-a)}	channel to ambient			62.0	°C/W

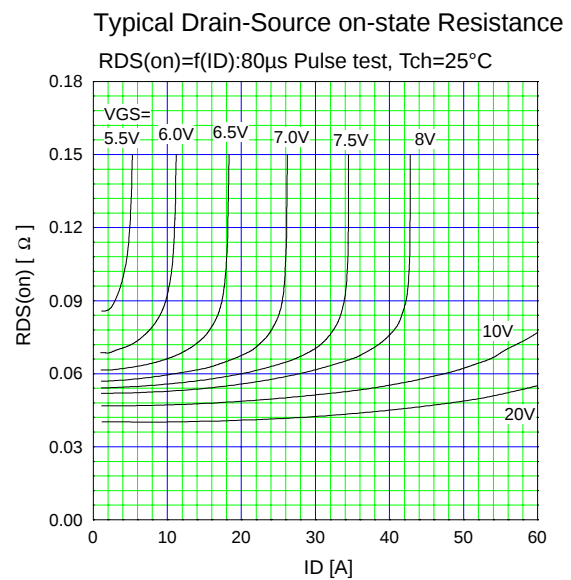
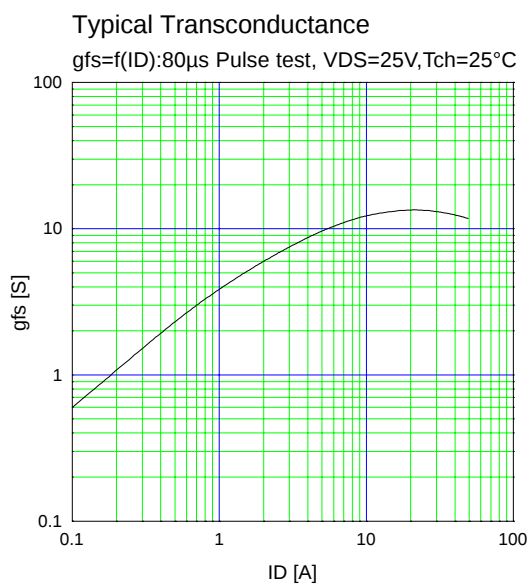
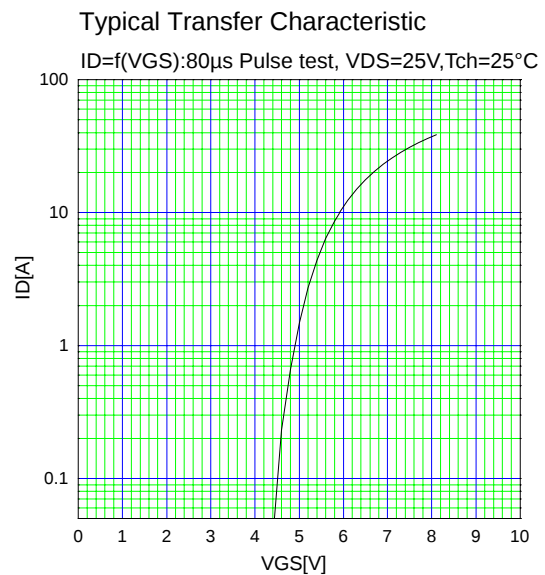
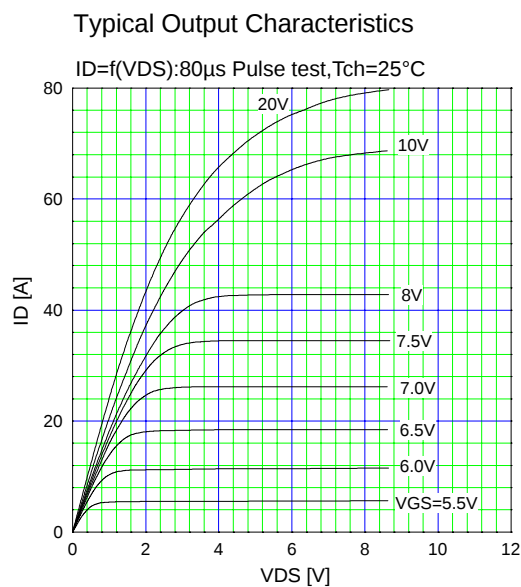
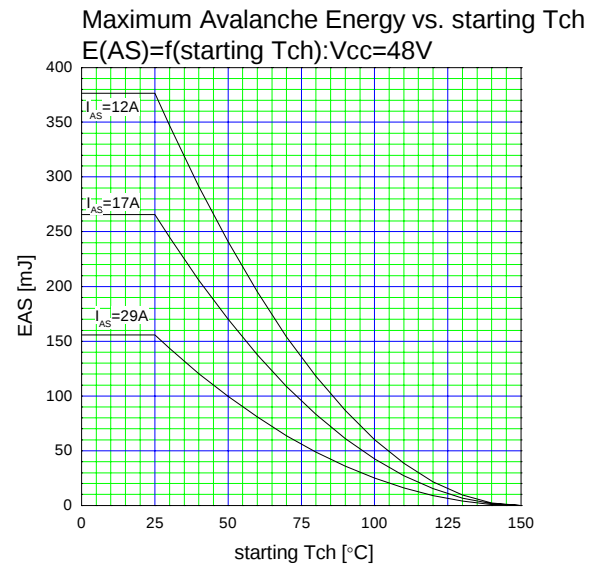
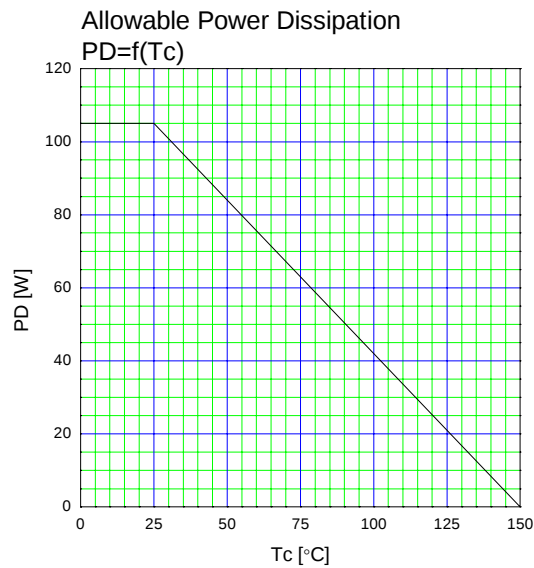
■ Outline Drawings (mm)



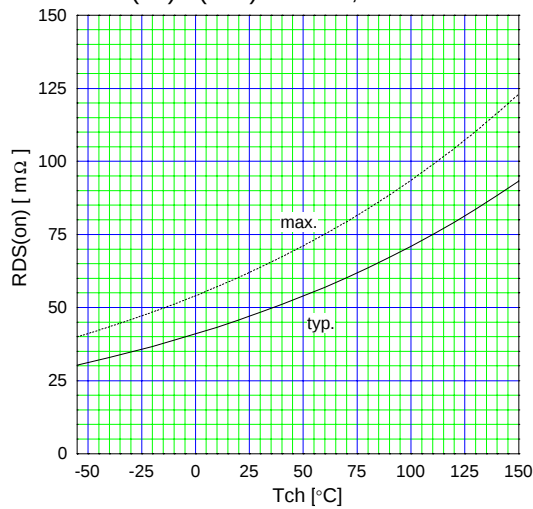
■ Equivalent circuit schematic



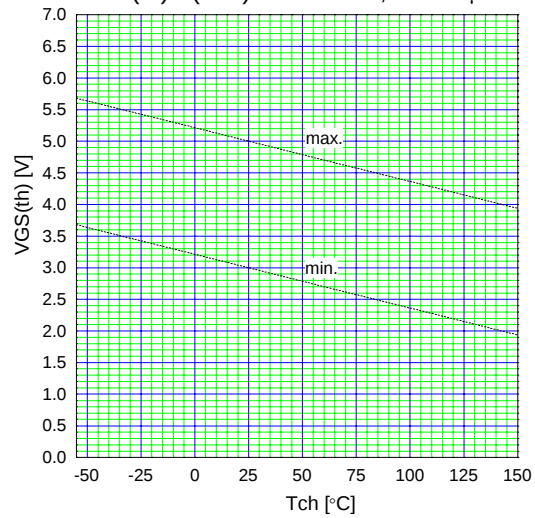
Characteristics



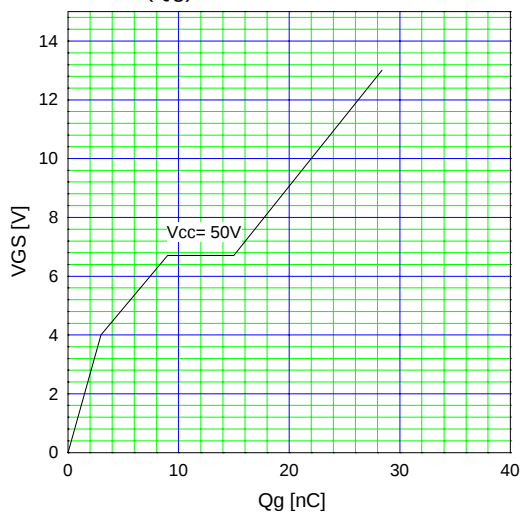
Drain-Source On-state Resistance
 $R_{DS(on)} = f(T_{ch}): I_D = 10A, V_{GS} = 10V$



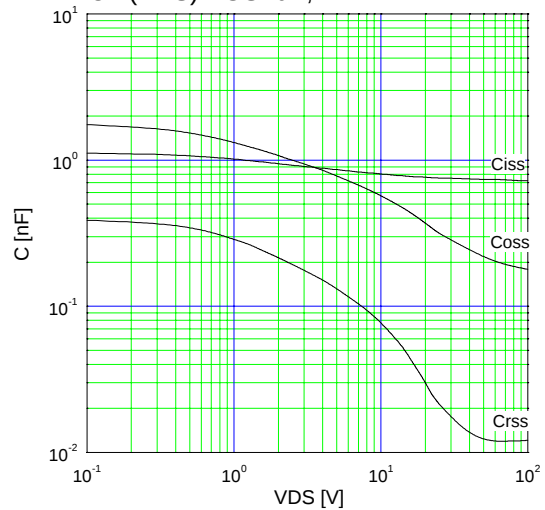
Gate Threshold Voltage vs. T_{ch}
 $V_{GS(th)} = f(T_{ch}): V_{DS} = V_{GS}, I_D = 250\mu A$



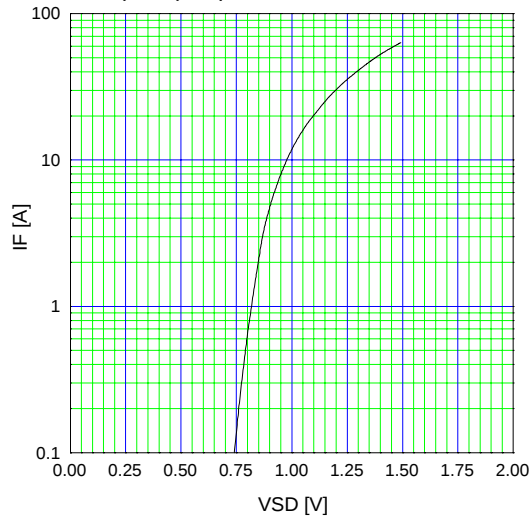
Typical Gate Charge Characteristics
 $V_{GS} = f(Q_g): I_D = 20A, T_{ch} = 25^{\circ}C$



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
 $t = f(I_D): V_{CC} = 48V, V_{GS} = 10V, R_G = 10\Omega$

