

## FAP-III B Series

## N-CHANNEL SILICON POWER MOSFET

### Features

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

### Applications

- Switching regulators
- UPS (Uninterruptible Power Supply)
- DC-DC converters

### Maximum ratings and characteristic Absolute maximum ratings

(T<sub>c</sub>=25°C unless otherwise specified)

Item	Symbol	Ratings	Unit
Drain-source voltage	V <sub>DS</sub>	60	V
Continuous drain current	I <sub>D</sub>	±45	A
Pulsed drain current	I <sub>Dp</sub>	±180	A
Gate-source voltage	V <sub>GS</sub>	±20	V
Maximum avalanche energy	E <sub>AV</sub> *1	461.9	mJ
Maximum power dissipation	P <sub>D</sub>	60	W
Operating and storage	T <sub>ch</sub>	+150	°C
Temperature range	T <sub>stg</sub>	-55 to +150	°C

\*1 L=0.304mH, V<sub>CC</sub>=24V

### Electrical characteristics (T<sub>c</sub> =25°C unless otherwise specified)

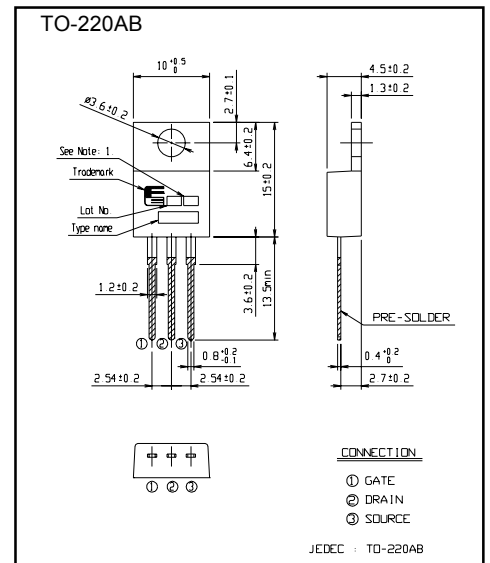
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	BV <sub>DSS</sub>	I <sub>D</sub> =1mA V <sub>GS</sub> =0V	60			V
Gate threshold voltage	V <sub>GS(th)</sub>	I <sub>D</sub> =1mA V <sub>DS</sub> =V <sub>GS</sub>	1.0	1.5	2.0	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =60V V <sub>GS</sub> =0V	T <sub>ch</sub> =25°C	10	500	μA
			T <sub>ch</sub> =125°C	0.2	1.0	mA
Gate-source leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V V <sub>DS</sub> =0V		10	100	nA
Drain-source on-state resistance	R <sub>DS(on)</sub>	I <sub>D</sub> =22.5A	V <sub>GS</sub> =4V	15	20	mΩ
			V <sub>GS</sub> =10V	10	12	
Forward transconductance	g <sub>fs</sub>	I <sub>D</sub> =22.5A V <sub>DS</sub> =25V	15.0	35.0		S
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V		2900	4350	pF
Output capacitance	C <sub>oss</sub>	V <sub>GS</sub> =0V		930	1400	
Reverse transfer capacitance	C <sub>rss</sub>	f=1MHz		260	390	
Turn-on time t <sub>on</sub>	td(on)	V <sub>CC</sub> =30V I <sub>D</sub> =45A		13	30	ns
	t <sub>r</sub>			35	50	
	td(off)		V <sub>GS</sub> =10V	190	290	
Turn-off time t <sub>off</sub>	td(off)	R <sub>GS</sub> =10Ω		75	140	
	t <sub>f</sub>					
Avalanche capability	I <sub>AV</sub>	L=100μH T <sub>ch</sub> =25°C	45			A
Diode forward on-voltage	V <sub>SD</sub>	I <sub>F</sub> =45A V <sub>GS</sub> =0V T <sub>ch</sub> =25°C		0.95	1.43	V
Reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> =45A V <sub>GS</sub> =0V		55		ns
Reverse recovery charge	Q <sub>rr</sub>	-di/dt=100A/μs T <sub>ch</sub> =25°C		0.10		μC

### Thermal characteristics

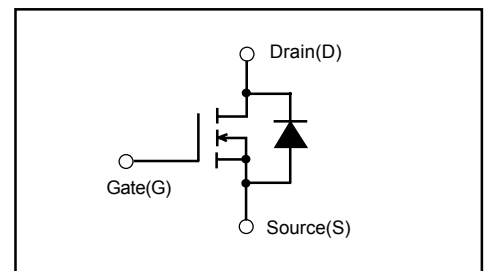
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	R <sub>th(ch-c)</sub>	channel to case			2.08	°C/W
	R <sub>th(ch-a)</sub>	channel to ambient			75.0	°C/W

<http://www.fujielectric.co.jp/fdt/scd/>

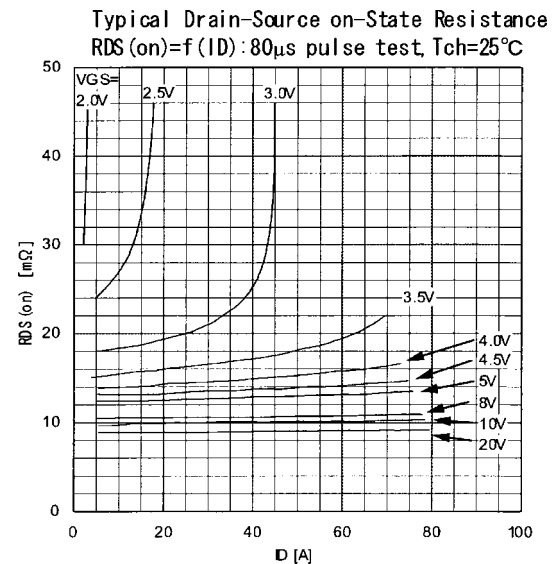
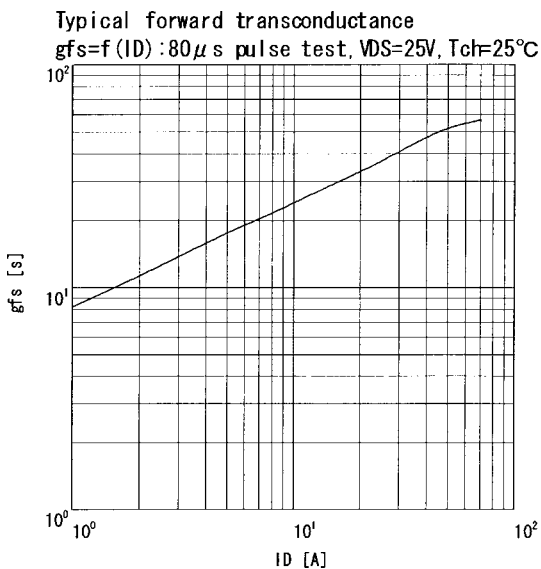
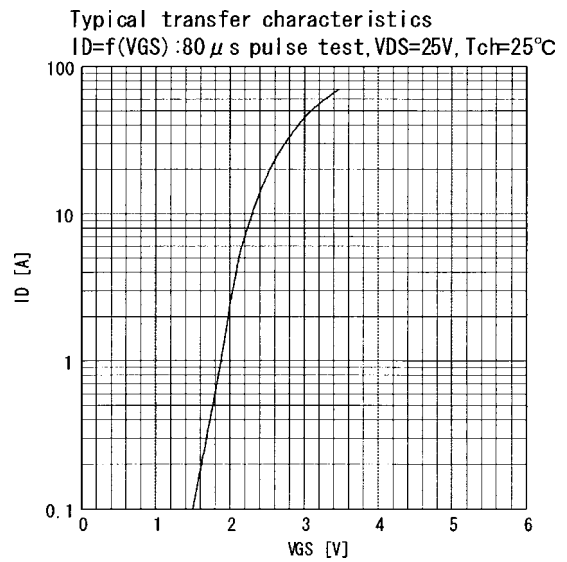
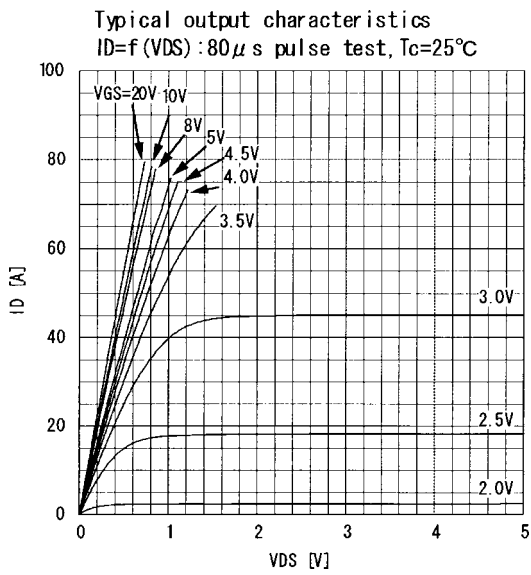
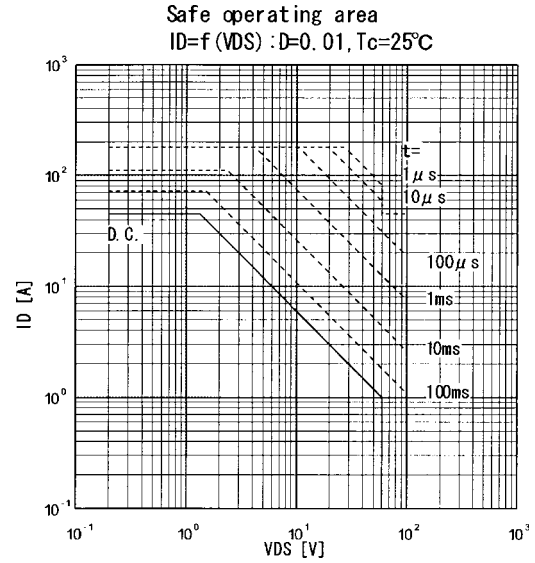
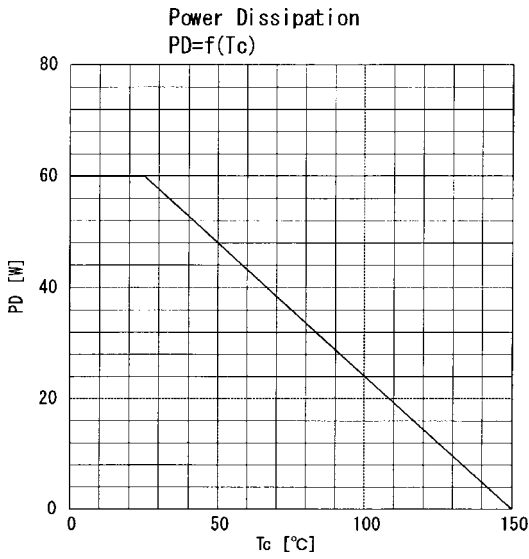
### Outline Drawings [mm]

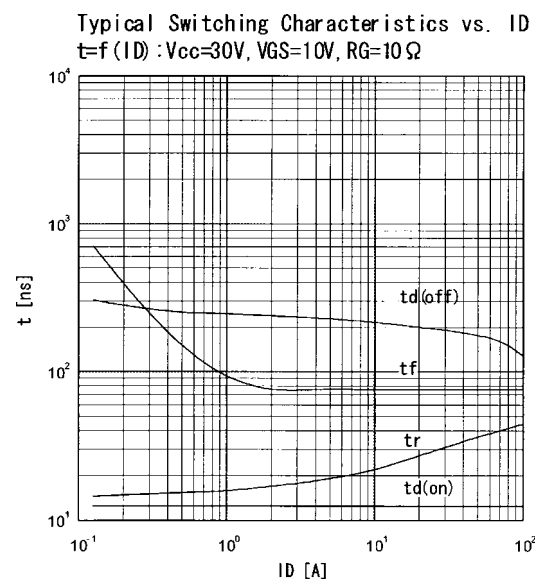
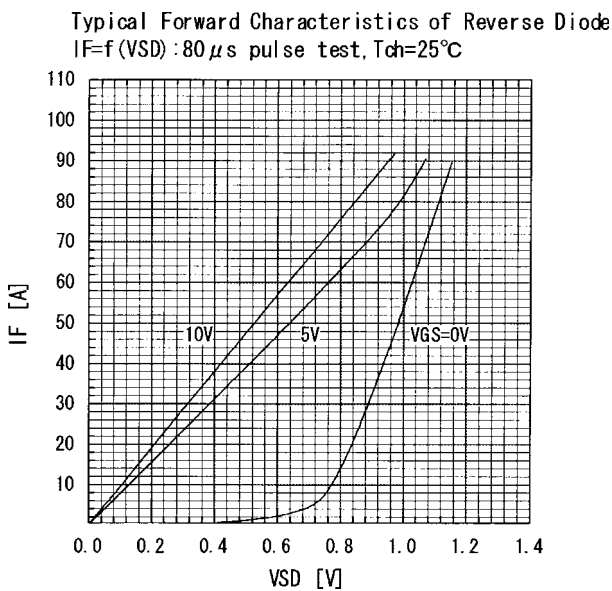
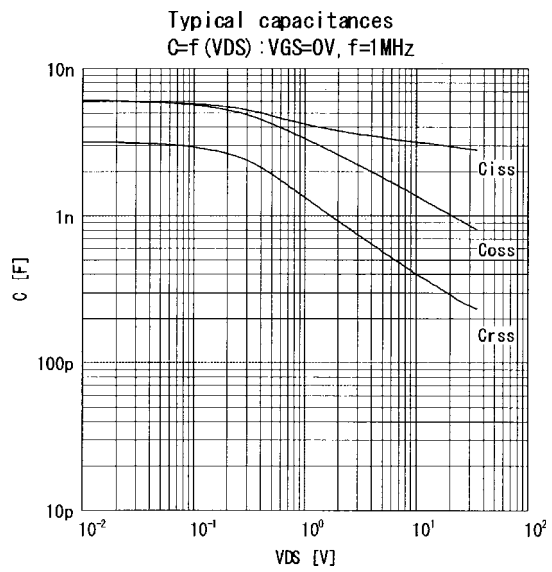
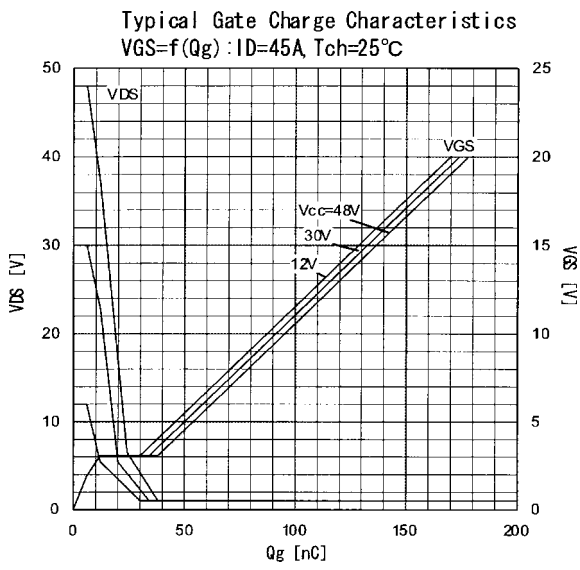
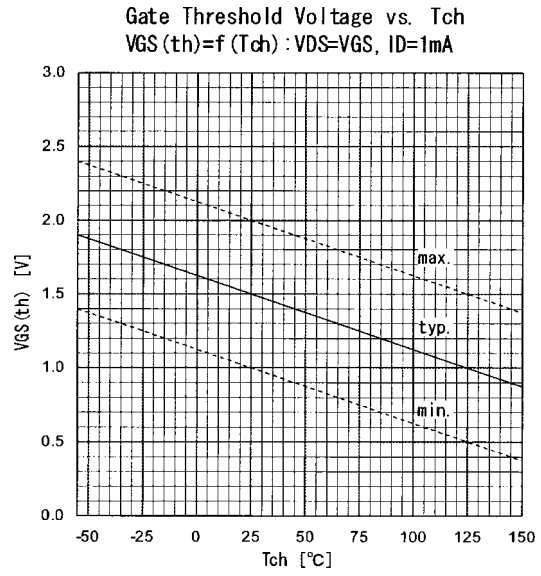
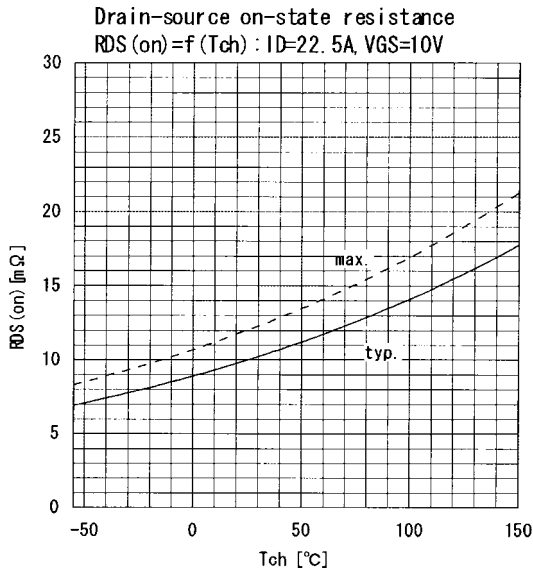


### Equivalent circuit schematic

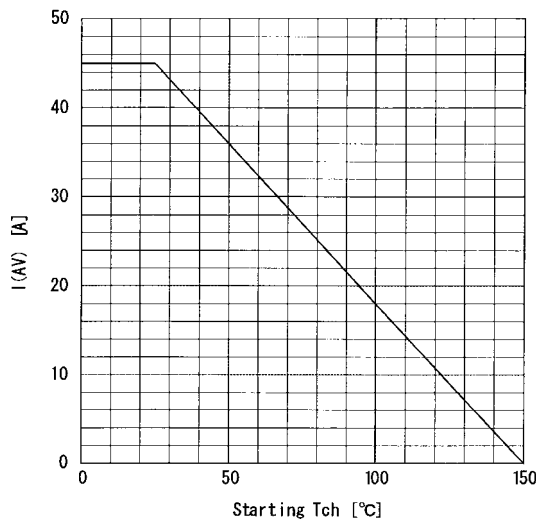


Characteristics

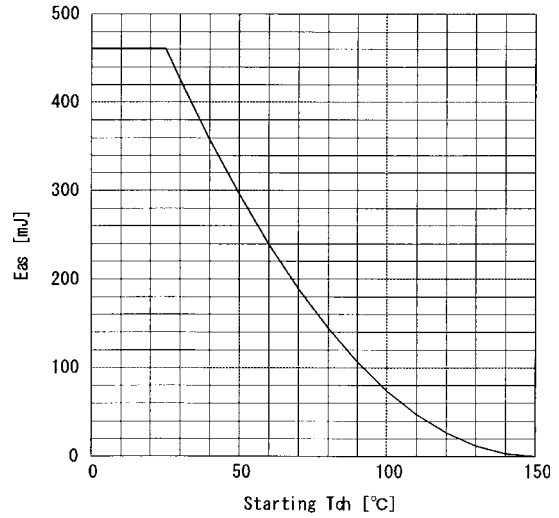




Maximum Avalanche Current vs. starting Tch  
 $I_{(AV)} = f(\text{starting Tch})$



Maximum Avalanche energy vs. starting Tch  
 $E_{as} = f(\text{starting Tch}) : V_{cc} = 24V, I_{AV} \leq 45A$



Transient thermal impedance  
 $Z_{thch} = f(t)$  parameter:  $D = t/T$

