

## N-CHANNEL SILICON POWER MOSFET

## FAP-IIA SERIES

### ■ Features

- High speed switching
- Low on-resistance
- No secondary breakdown
- Low driving power
- High voltage
- V<sub>GS</sub>=±30V Guarantee
- Avalanche-proof

### ■ Applications

- Switching regulators
- UPS
- DC-DC converters
- General purpose power amplifier

### ■ Maximum ratings and characteristics

#### ● Absolute maximum ratings (T<sub>c</sub>=25°C unless otherwise specified)

Item	Symbol	Rating	Unit
Drain-source voltage	V <sub>DS</sub>	1000	V
Continuous drain current	I <sub>D</sub>	4	A
Pulsed drain current	I <sub>D(puls)</sub>	16	A
Continuous reverse drain current	I <sub>DR</sub>	4	A
Gate-source peak voltage	V <sub>GS</sub>	±30	V
Max. power dissipation	P <sub>D</sub>	80	W
Operating and storage temperature range	T <sub>ch</sub>	+150	°C
	T <sub>stg</sub>	-55 to +150	°C

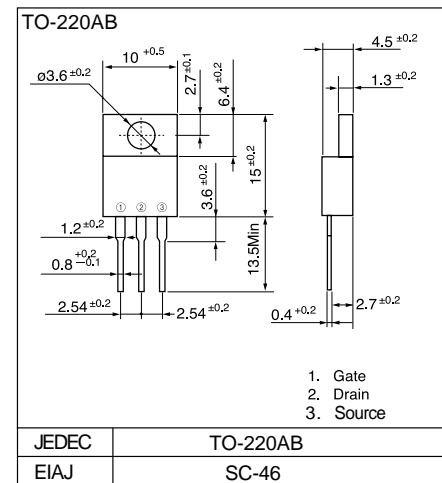
#### ● Electrical characteristics (T<sub>c</sub> =25°C unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units	
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> =1mA V <sub>GS</sub> =0V	1000			V	
Gate threshold voltage	V <sub>GS(th)</sub>	I <sub>D</sub> =1mA V <sub>DS</sub> =V <sub>GS</sub>	2.5	3.0	3.5	V	
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =1000V 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> =±30V V <sub>DS</sub> =0V		10	100	nA	
Drain-source on-state resistance	R <sub>DS(on)</sub>	I <sub>D</sub> =2A V <sub>GS</sub> =10V		2.7	3.6	Ω	
Forward transconductance	g <sub>fs</sub>	I <sub>D</sub> =2A V <sub>DS</sub> =25V	2.0	5.0		S	
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V		1300	1950	pF	
Output capacitance	C <sub>oss</sub>	V <sub>GS</sub> =0V		100	150		
Reverse transfer capacitance	C <sub>rss</sub>	f=1MHz		35	55		
Turn-on time t <sub>on</sub> (t <sub>on</sub> =t <sub>d(on)</sub> +t <sub>r</sub> )	t <sub>d(on)</sub>	V <sub>CC</sub> =600V R <sub>G</sub> =10 Ω		20	30	ns	
	t <sub>r</sub>	I <sub>D</sub> =4A		15	25		
Turn-off time t <sub>off</sub> (t <sub>off</sub> =t <sub>d(off)</sub> +t <sub>f</sub> )	t <sub>d(off)</sub>	V <sub>GS</sub> =10V		85	130		
	t <sub>f</sub>			20	30		
Avalanche capability	I <sub>AV</sub>	L=100μH T <sub>ch</sub> =25°C	4			A	
Diode forward on-voltage	V <sub>SD</sub>	I <sub>F</sub> =2I <sub>DR</sub> V <sub>GS</sub> =0V T <sub>ch</sub> =25°C		1.1	1.65	V	
Reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> =I <sub>DR</sub> V <sub>GS</sub> =0V		400		ns	
Reverse recovery charge	Q <sub>rr</sub>	-di/dt=100A/μs T <sub>ch</sub> =25°C		3		μC	

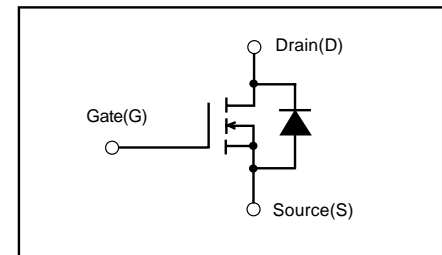
#### ● Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	R <sub>th(ch-a)</sub>	channel to ambient			75.0	°C/W
	R <sub>th(ch-c)</sub>	channel to case			1.56	°C/W

### ■ Outline Drawings

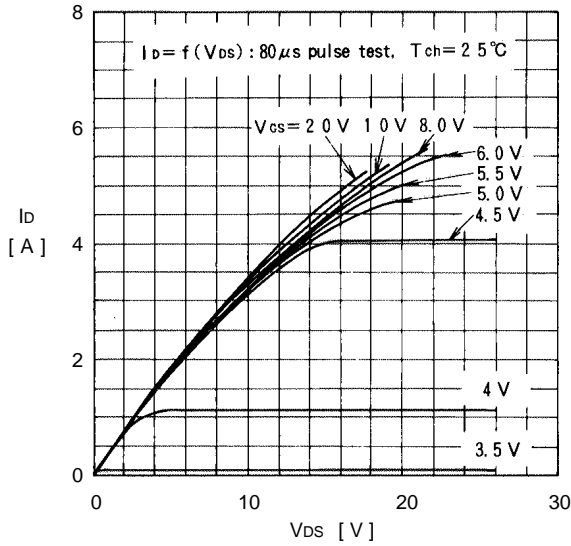


### ■ Equivalent circuit schematic

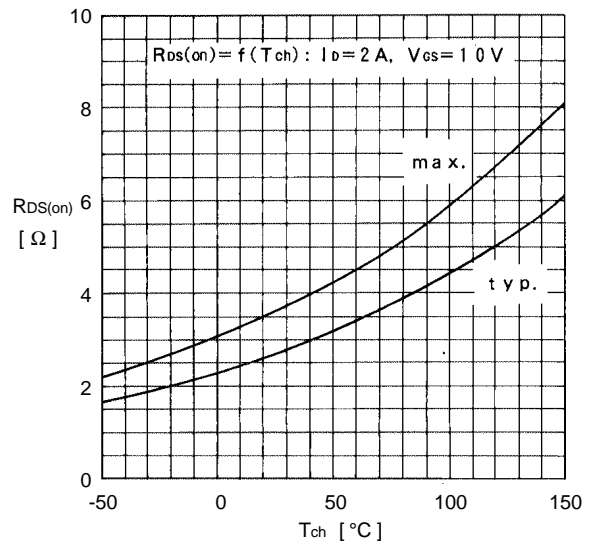


Characteristics

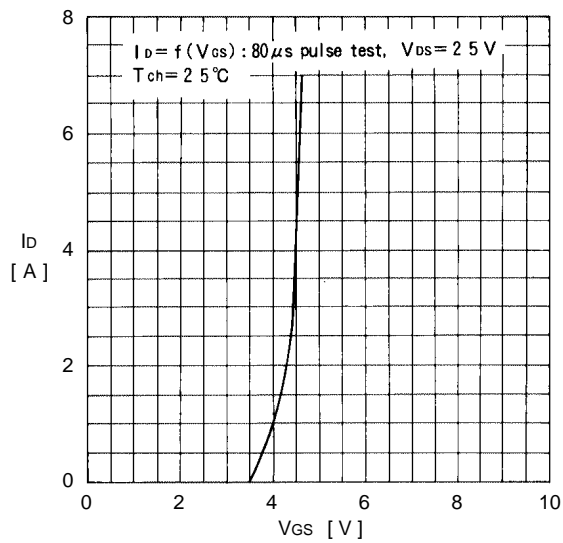
Typical output characteristics



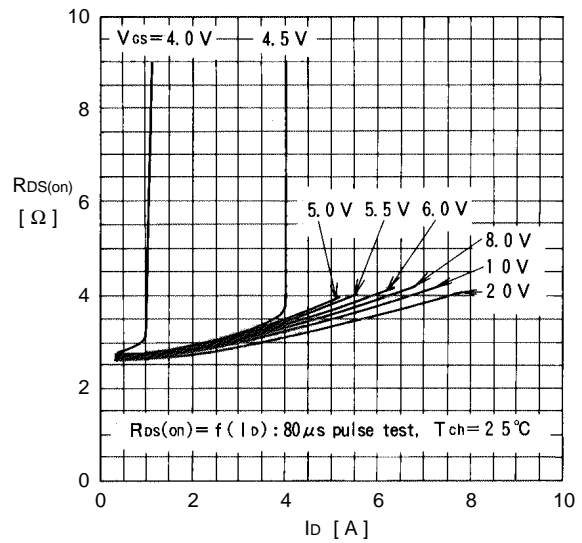
On state resistance vs.  $T_{ch}$



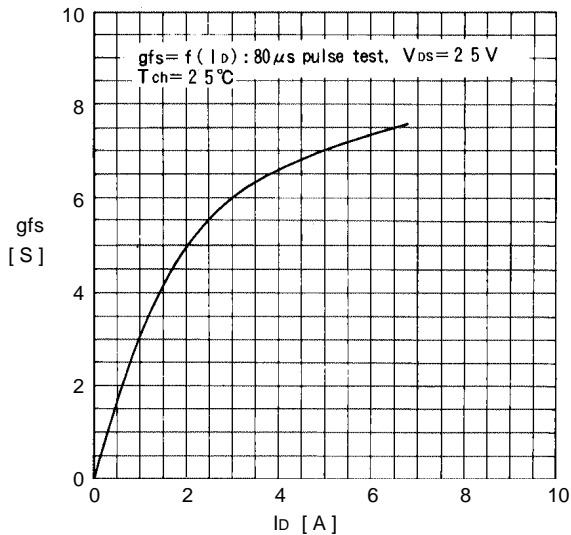
Typical transfer characteristics



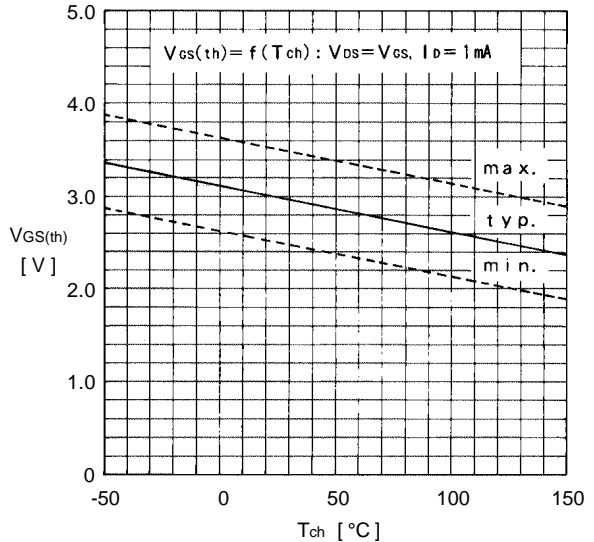
Typical Drain-Source on state resistance vs.  $I_D$



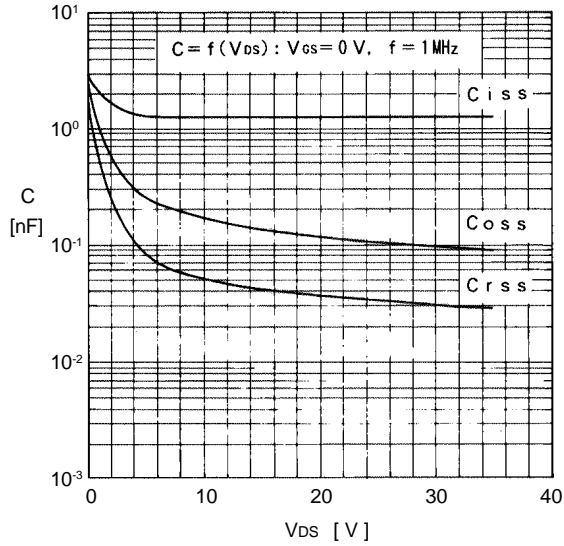
Typical forward transconductance vs.  $I_D$



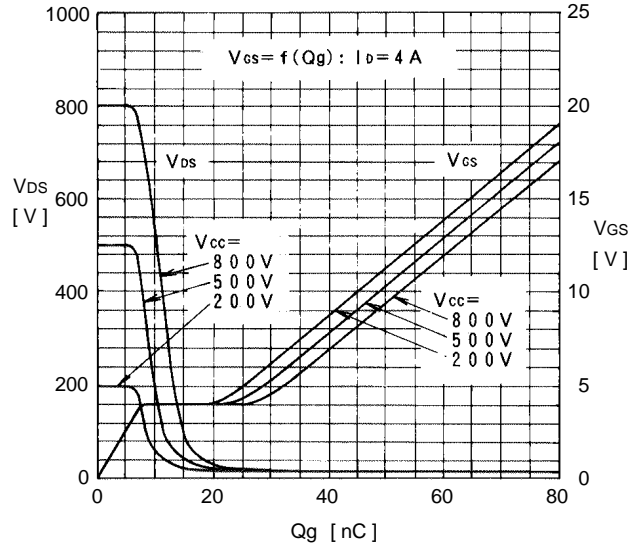
Gate threshold voltage vs.  $T_{ch}$



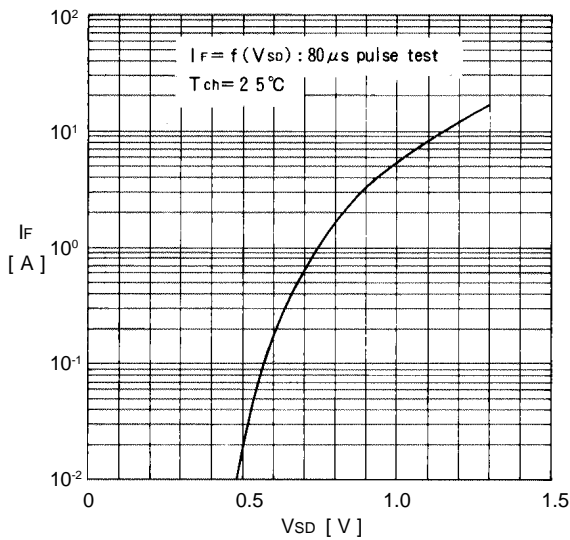
Typical capacitance vs.  $V_{DS}$



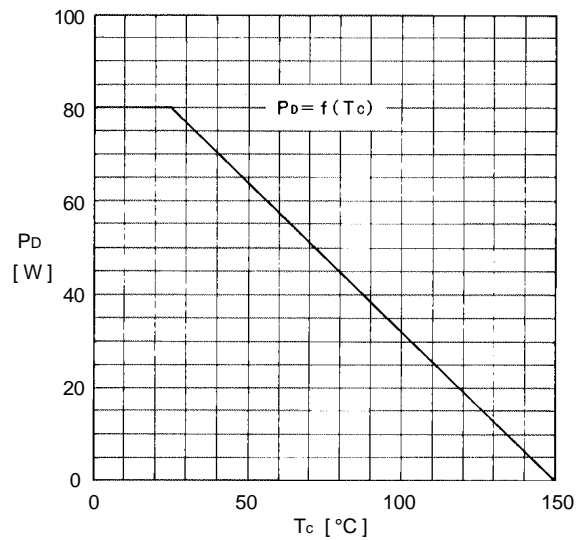
Typical input charge



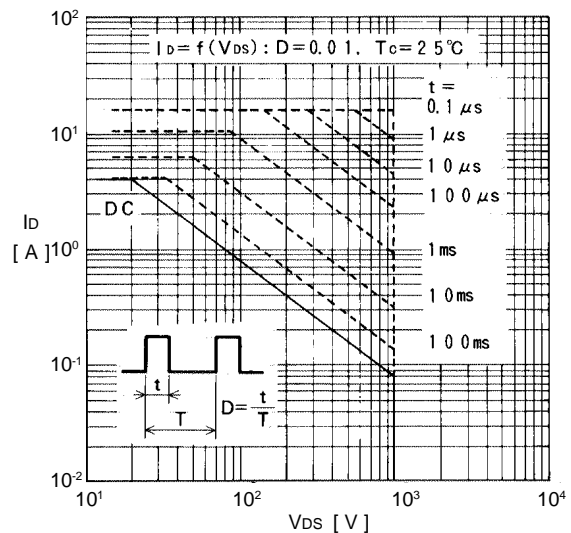
Forward characteristics of reverse diode



Allowable power dissipation vs.  $T_c$



Safe operating area



Transient thermal impedance

