

N-CHANNEL SILICON POWER MOSFET

FAP-IIA SERIES

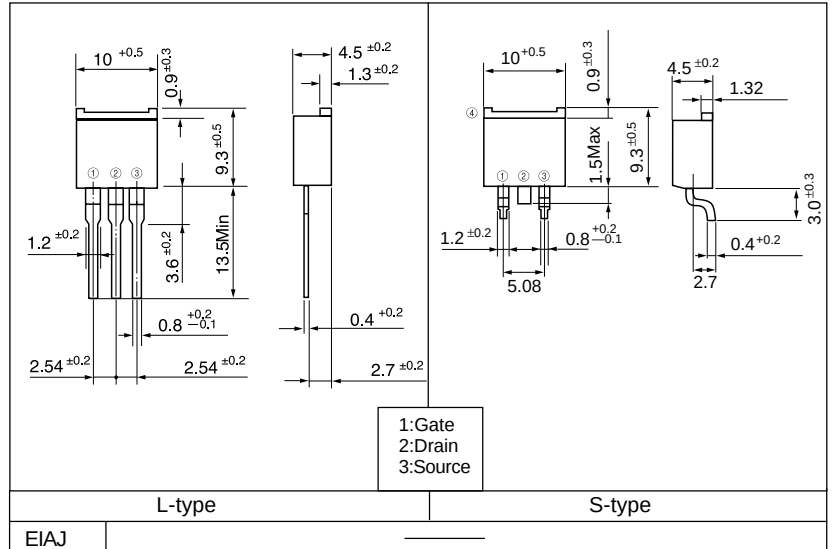
■ Features

- High speed switching
- Low on-resistance
- No secondary breakdown
- Low driving power
- High voltage
- $V_{GS}=\pm 30V$ Guarantee
- Avalanche-proof

■ Applications

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

■ Outline Drawings

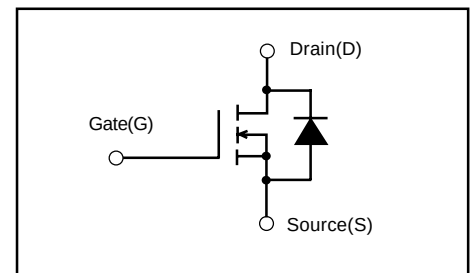


■ Maximum ratings and characteristics

● Absolute maximum ratings ($T_c=25^\circ\text{C}$ unless otherwise specified)

Item	Symbol	Rating	Unit
Drain-source voltage	V_{DS}	900	V
Continuous drain current	I_D	5	A
Pulsed drain current	$I_{D(puls)}$	20	A
Continuous reverse drain current	I_{DR}	5	A
Gate-source peak voltage	V_{GS}	± 30	V
Max. power dissipation	P_D	80	W
Operating and storage temperature range	T_{ch} T_{stg}	$+150$ -55 to $+150$	$^\circ\text{C}$ $^\circ\text{C}$

■ Equivalent circuit schematic



● Electrical characteristics ($T_c=25^\circ\text{C}$ unless otherwise specified)

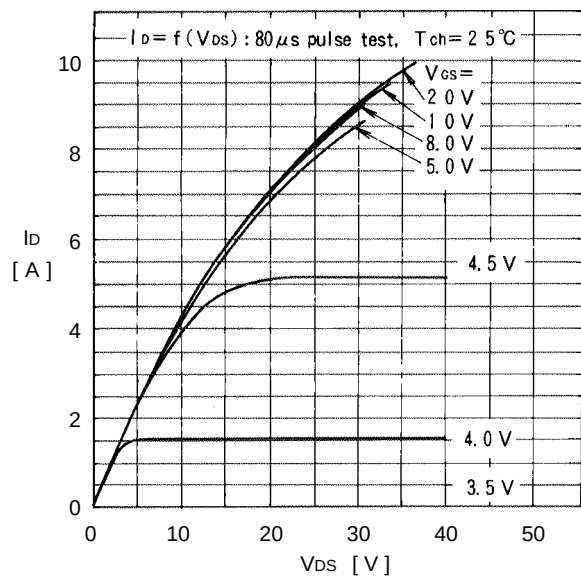
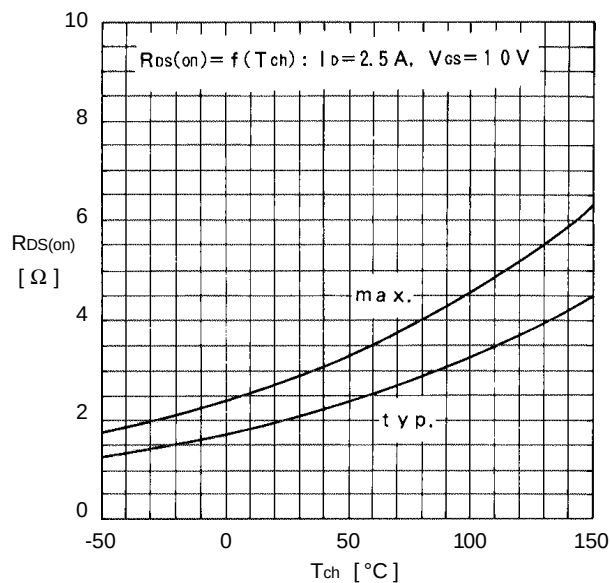
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D=1\text{mA}$ $V_{GS}=0\text{V}$	900			V
Gate threshold voltage	$V_{GS(th)}$	$I_D=1\text{mA}$ $V_{DS}=V_{GS}$	2.5	3.0	3.5	V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=900\text{V}$ $V_{GS}=0\text{V}$ $T_{ch}=25^\circ\text{C}$		10	500	μA
		$T_{ch}=125^\circ\text{C}$		0.2	1.0	mA
Gate-source leakage current	I_{GSS}	$V_{GS}=\pm 30\text{V}$ $V_{DS}=0\text{V}$		10	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$I_D=2.5\text{A}$ $V_{GS}=10\text{V}$		2.0	2.8	Ω
Forward transconductance	g_{fs}	$I_D=2.5\text{A}$ $V_{DS}=25\text{V}$	3.0	6.0		S
Input capacitance	C_{iss}	$V_{DS}=25\text{V}$		1200	1800	pF
Output capacitance	C_{oss}	$V_{GS}=0\text{V}$		120	180	
Reverse transfer capacitance	C_{rss}	$f=1\text{MHz}$		40	60	
Turn-on time t_{on} ($t_{on}=t_{d(on)}+t_r$)	$t_{d(on)}$	$V_{CC}=600\text{V}$ $R_G=10\Omega$		25	40	ns
	t_r	$I_D=5\text{A}$		25	40	
Turn-off time t_{off} ($t_{off}=t_{d(off)}+t_r$)	$t_{d(off)}$	$V_{GS}=10\text{V}$		85	130	
	t_r			45	70	
Avalanche capability	I_{AV}	$L=100\mu\text{H}$ $T_{ch}=25^\circ\text{C}$	5			A
Diode forward on-voltage	V_{SD}	$I_F=2I_{DR}$ $V_{GS}=0\text{V}$ $T_{ch}=25^\circ\text{C}$		0.93	1.4	V
Reverse recovery time	t_{rr}	$I_F=I_{DR}$ $V_{GS}=0\text{V}$ $-di/dt=100\text{A}/\mu\text{s}$ $T_{ch}=25^\circ\text{C}$		400		ns

● Thermal characteristics

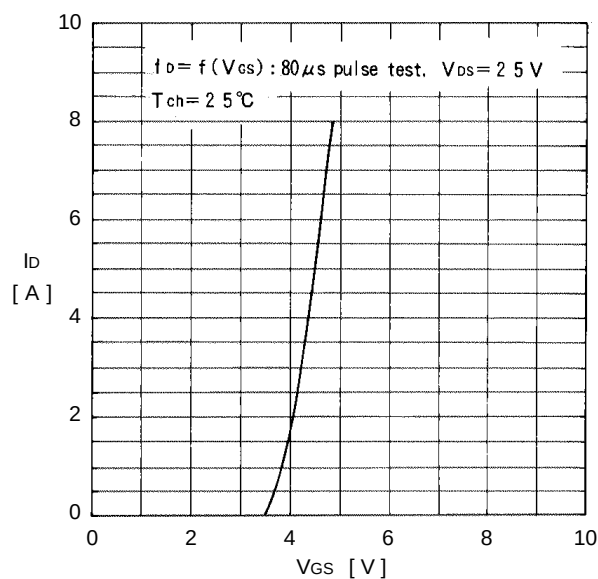
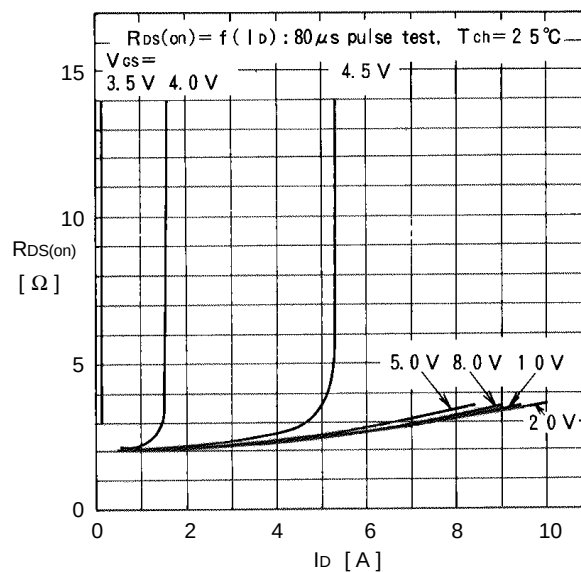
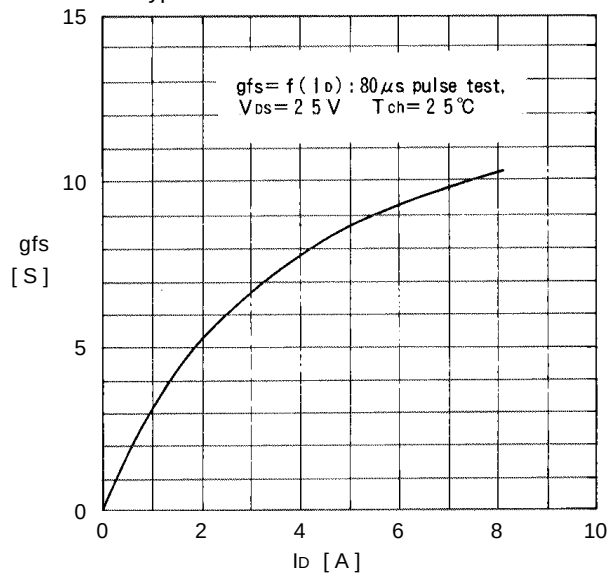
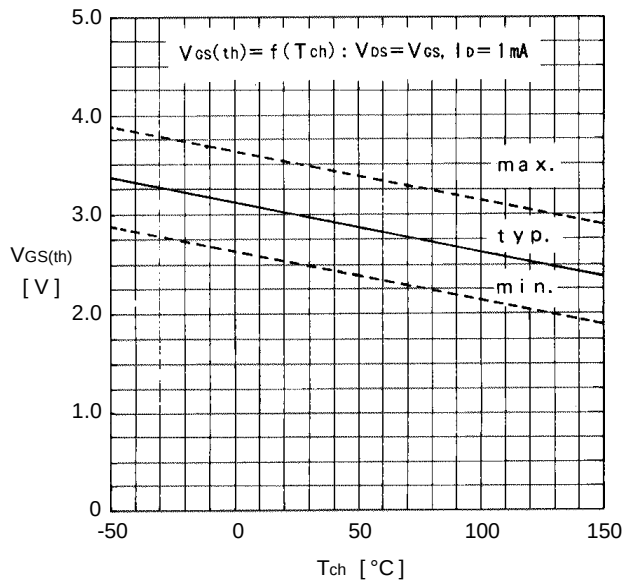
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-a)}$	channel to ambient			125.0	$^\circ\text{C}/\text{W}$
	$R_{th(ch-c)}$	channel to case			1.56	$^\circ\text{C}/\text{W}$

Characteristics

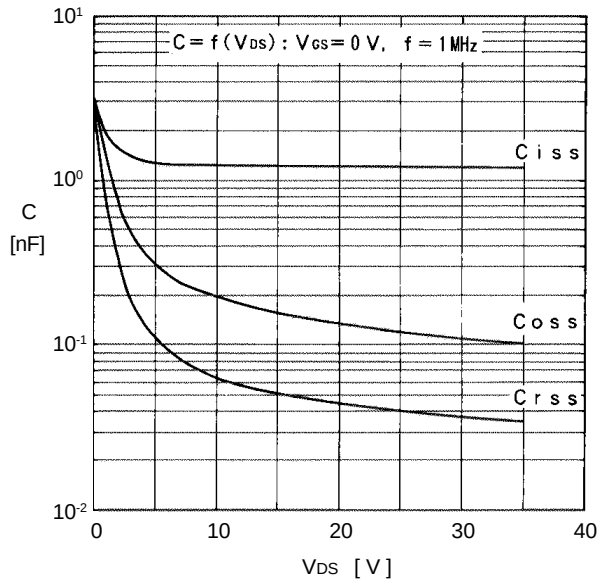
Typical output characteristics

On state resistance vs. T_{ch} 

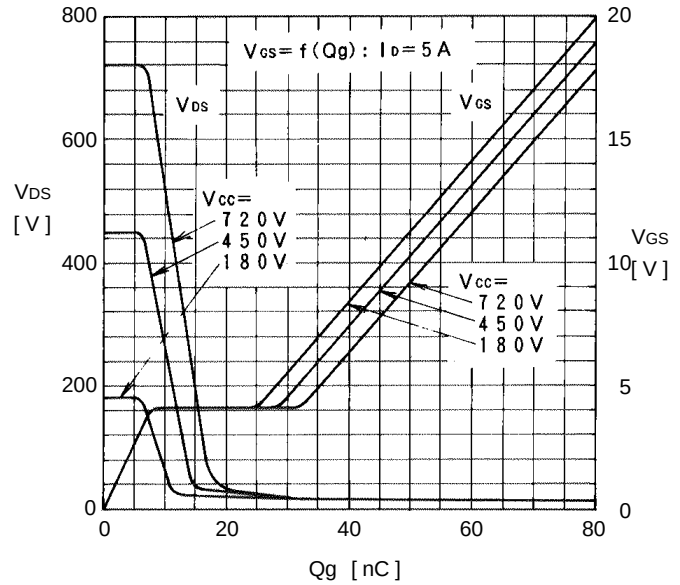
Typical transfer characteristics

Typical Drain-Source on state resistance vs. I_D Typical forward transconductance vs. I_D Gate threshold voltage vs. T_{ch} 

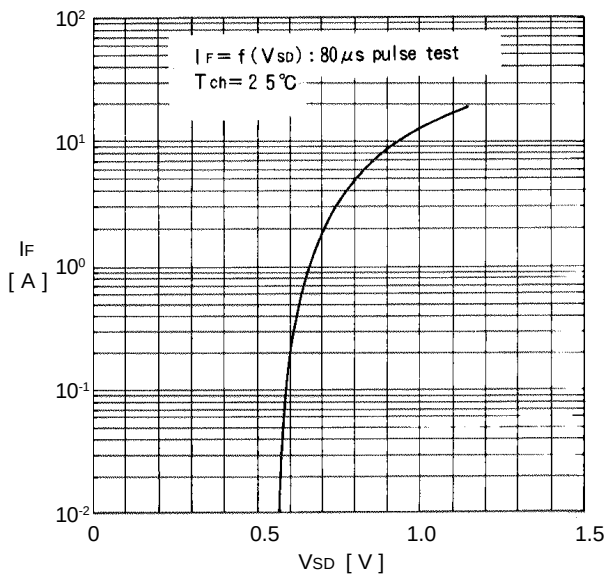
Typical capacitance vs. V_{DS}



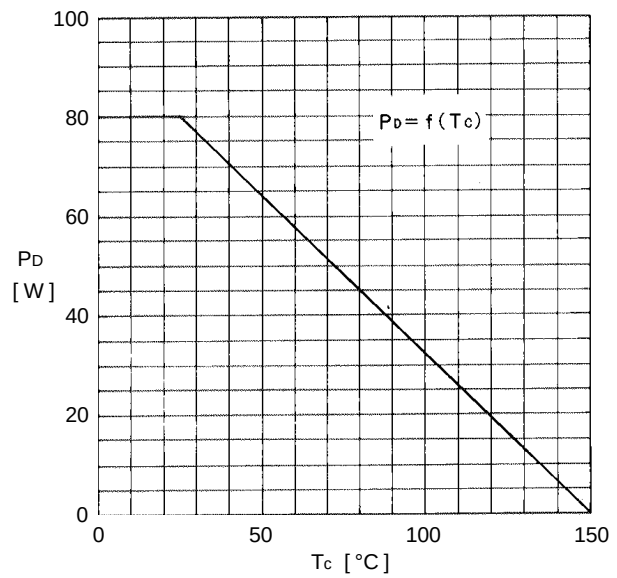
Typical input charge



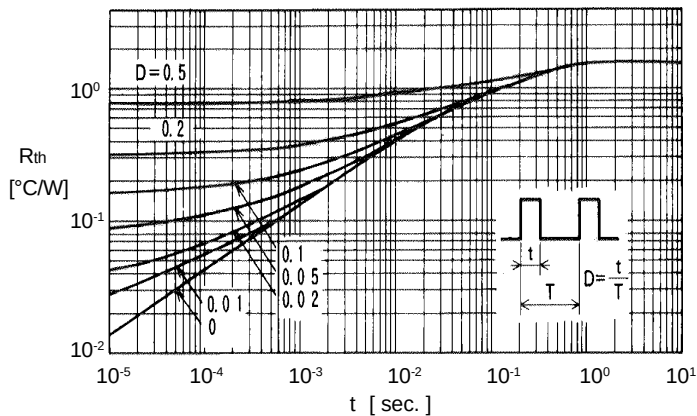
Forward characteristics of reverse diode



Allowable power dissipation vs. T_c



Transient thermal impedance



Safe operating area

