

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

Maximum ratings and characteristics

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

Item	Symbol	Rating	Unit	Remarks
Drain-source voltage	V_{DS}	900	V	
Drain-gate voltage	V_{DGR}	900	V	$R_{GS}=20K\Omega$
Continuous drain current	I_D	± 5	A	
Pulsed drain current	$I_D[puls]$	± 20	A	
Gate-source peak voltage	V_{GS}	± 30	V	
Max. power dissipation	P_D	80	W	
Operating and storage temperature range	T_{ch}	+150	$^\circ C$	
	T_{stg}	-55 to +150	$^\circ C$	

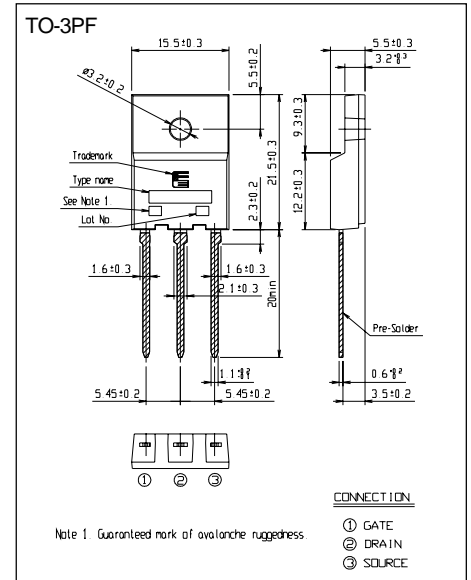
Electrical characteristics ($T_c = 25^\circ C$ unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units	
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D=1mA$ $V_{GS}=0V$	900			V	
Gate threshold voltage	$V_{GS(th)}$	$I_D=1mA$ $V_{DS}=V_{GS}$	2.5	3.0	3.5	V	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=900V$ $V_{GS}=0V$	$T_{ch}=25^\circ C$		10	500	μA
			$T_{ch}=125^\circ C$		0.2	1.0	mA
Gate-source leakage current	I_{GSS}	$V_{GS}=\pm 30V$ $V_{DS}=0V$		10	100	nA	
Drain-source on-state resistance	$R_{DS(on)}$	$I_D=2.5A$ $V_{GS}=10V$		2.0	2.8	Ω	
Forward transconductance	g_{fs}	$I_D=2.5A$ $V_{DS}=25V$	3.0	6.0		S	
Input capacitance	C_{iss}	$V_{DS}=25V$ $V_{GS}=0V$ $f=1MHz$		1200	1800	pF	
Output capacitance	C_{oss}			120	180		
Reverse transfer capacitance	C_{rss}			40	60		
Turn-on time	$t_{d(on)}$	$V_{CC}=600V$ $R_G=10\Omega$ $I_D=5A$		25	40	ns	
	t_r			25	40		
Turn-off time	$t_{d(off)}$	$V_{GS}=10V$		85	130		
	t_f			45	70		
Avalanche capability	I_{AV}	$L=100\mu H$ $T_{ch}=25^\circ C$	5.0			A	
Diode forward on-voltage	V_{SD}	$I_F=2I_{DR}$ $V_{GS}=0V$ $T_{ch}=25^\circ C$		0.93	1.4	V	
Reverse recovery time	t_{rr}	$I_F=I_{DR}$ $V_{GS}=0V$		400		ns	
Reverse recovery charge	Q_{rr}	$-di/dt=100A/\mu s$ $T_{ch}=25^\circ C$		1.5		μC	

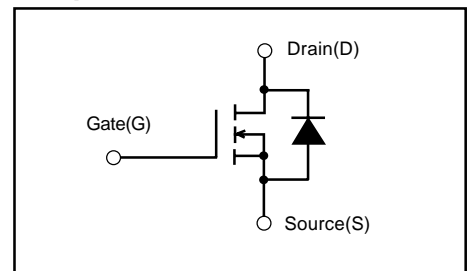
Thermal characteristics

Item	Symbol	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-c)}$			1.56	$^\circ C/W$
	$R_{th(ch-a)}$			30.0	$^\circ C/W$

Outline Drawings

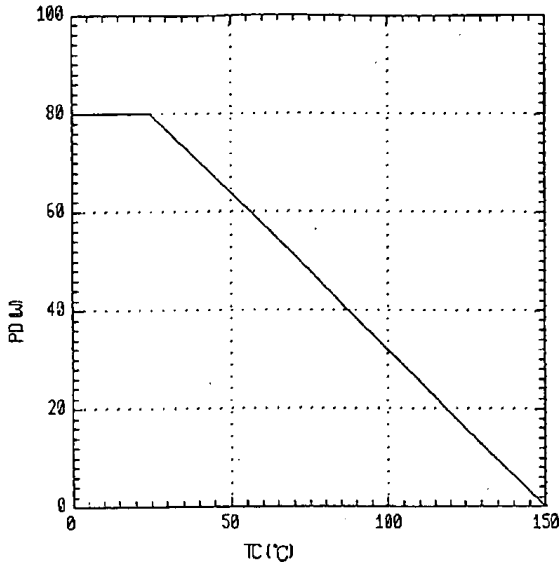


Equivalent circuit schematic

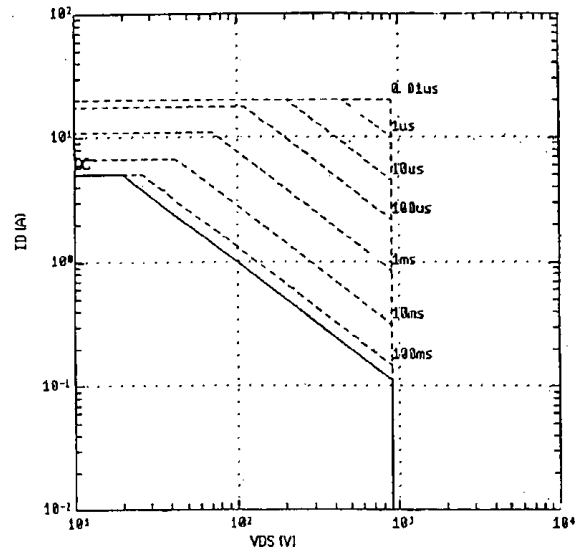


Characteristics

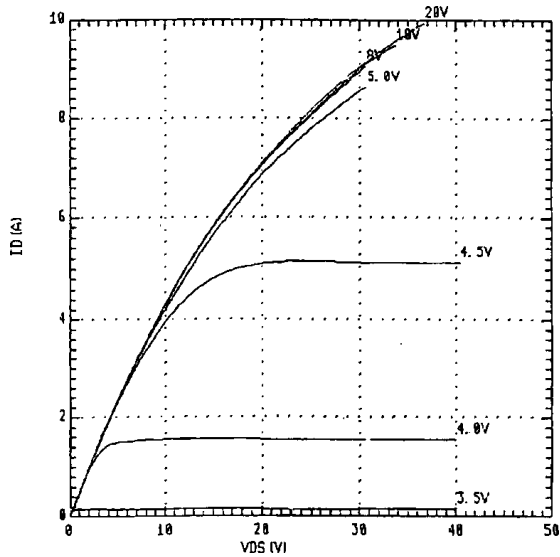
Power Dissipation
 $PD=f(TC)$



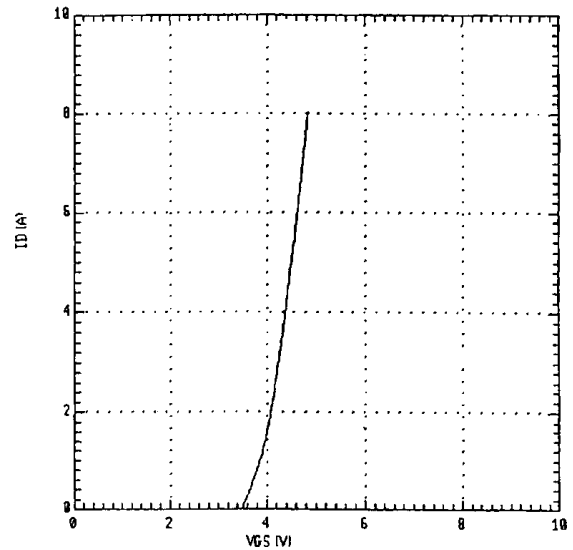
Safe operating area
 $ID=f(VDS): D=0.01, Tc=25^{\circ}C$



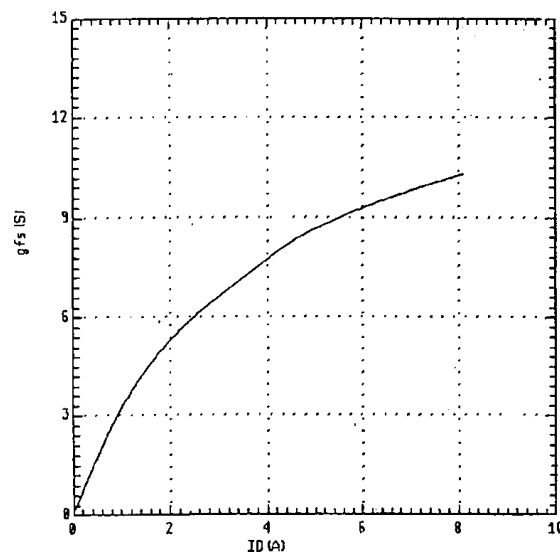
Typical output characteristics
 $ID=f(VDS): 80\mu s$ pulse test, $Tch=25^{\circ}C$



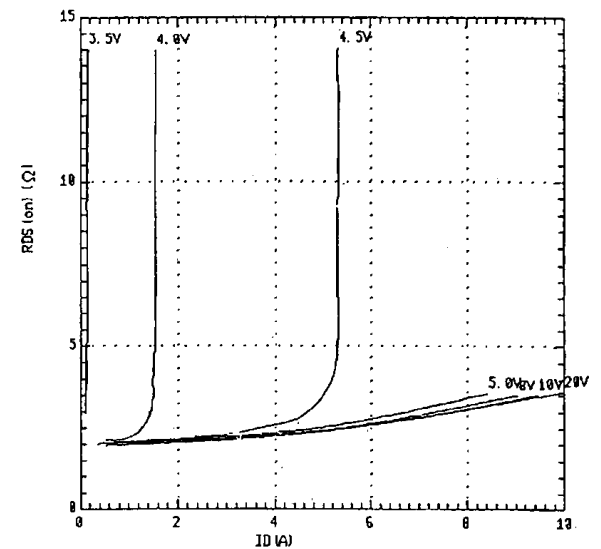
Typical Transfer Characteristic
 $ID=f(VGS): 80\mu s$ pulse test, $VDS=25V$



Typical Transconductance
 $gfs=f(ID): 80\mu s$ pulse test, $VDS=25V, Tch=25^{\circ}C$

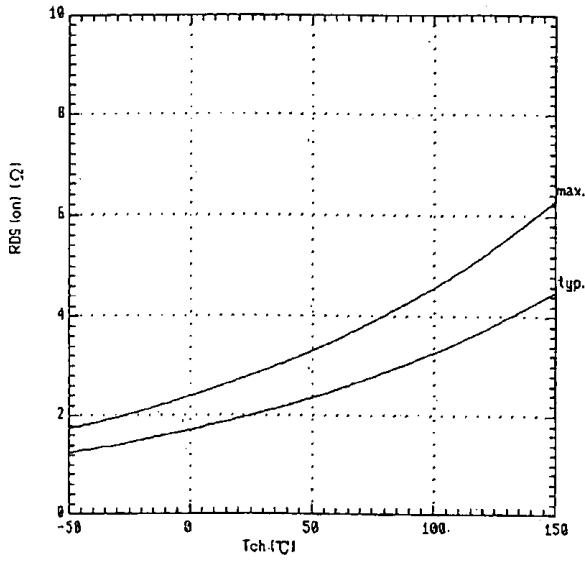


Typical Drain-source on-state resistance
 $RDS(on)=f(ID): 80\mu s$ pulse test, $Tch=25^{\circ}C$

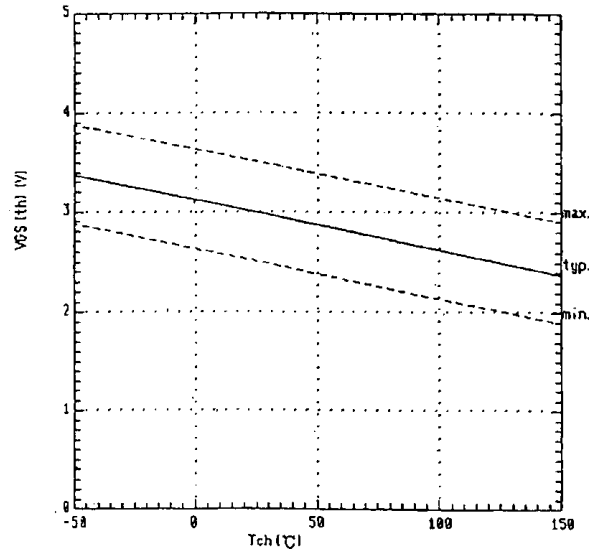


FUJI POWER MOSFET

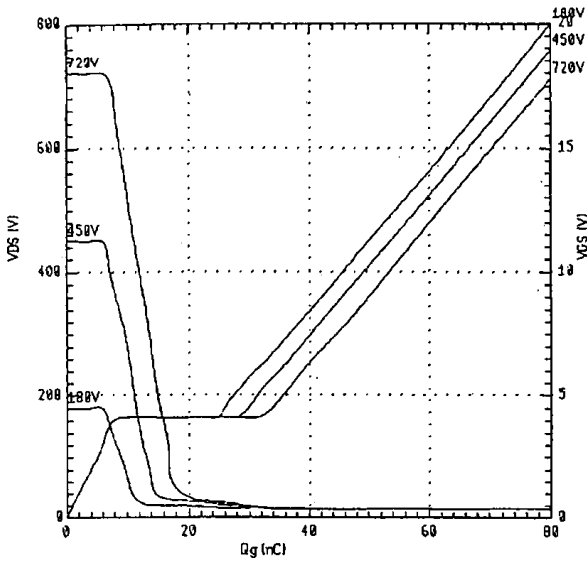
Drain-source on-state resistance
 $R_{DS(on)} = f(T_{ch}) : I_D = 2.5A, V_{GS} = 10V$



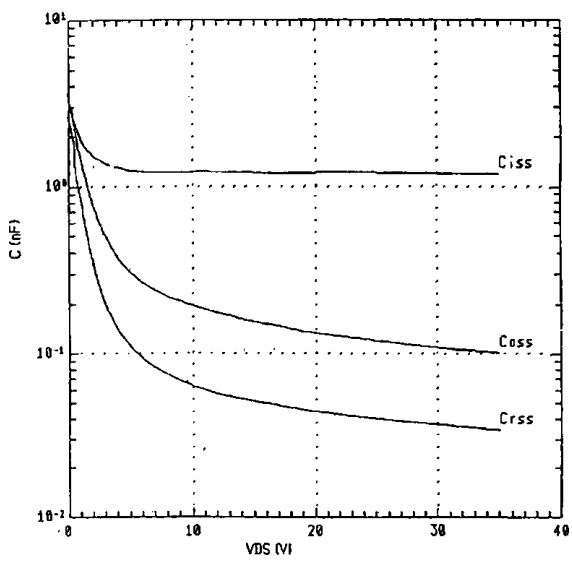
Gate threshold voltage
 $V_{GS(th)} = f(T_{ch}) : V_{DS} = V_{GS}, I_D = 1mA$



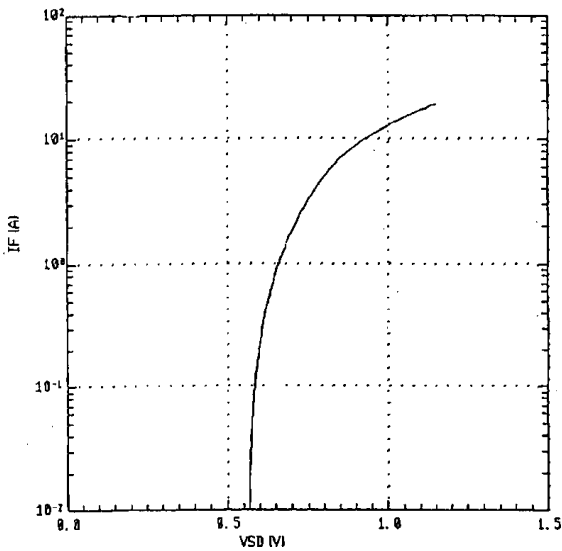
Typical gate charge characteristics
 $V_{GS} = f(Q_g) : I_D = 5A$



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



Forward characteristic of reverse diode
 $I_F = f(V_{SD}) : 80\mu s \text{ pulse test}$



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

