

P-CHANNEL SILICON POWER MOSFET

FAP-III SERIES

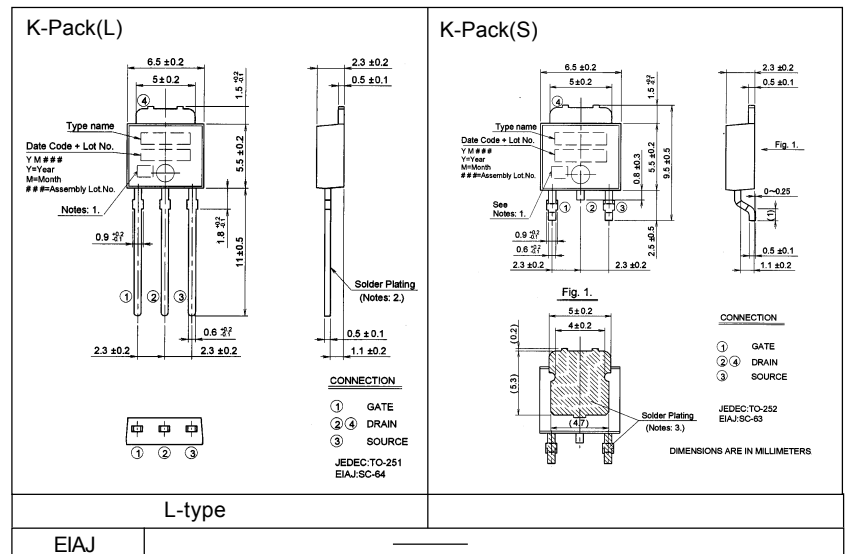
Features

- High speed switching
- Low on-resistance
- No secondary breakdown
- Low driving power
- High forward Transconductance
- Avalanche-proof

Applications

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

Outline Drawings

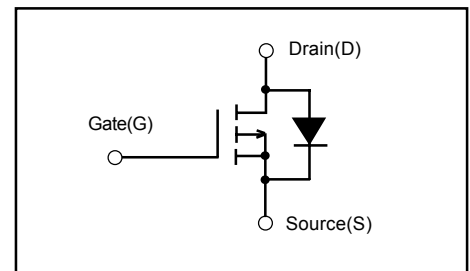


Maximum ratings and characteristics

Absolute maximum ratings (Tc=25°C unless otherwise specified)

Item	Symbol	Rating	Unit
Drain-source voltage	V _{DS}	-60	V
Drain-gate voltage (R _{GS} =20kΩ)	V _{DGR}	-60	V
Continuous drain current	I _D	-5	A
Pulsed drain current	I _{D(puls)}	-20	A
Gate-source voltage	V _{GS}	±20	V
Max. power dissipation	P _D	20	W
Operating and storage temperature range	T _{ch}	+150	°C
	T _{slg}	-55 to +150	°C

Equivalent circuit schematic



Electrical characteristics (Tc = 25°C unless otherwise specified)

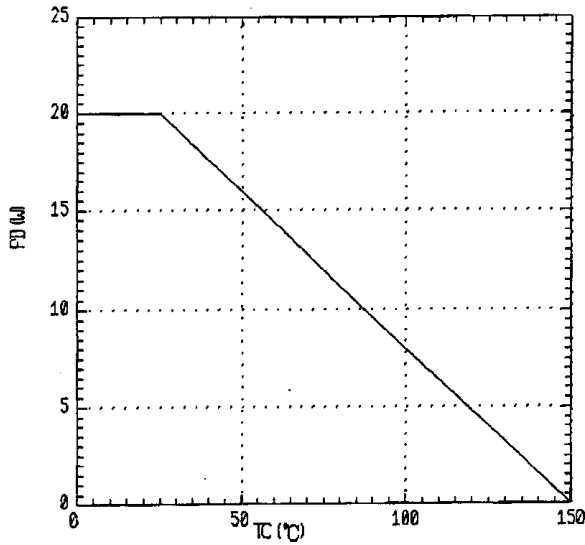
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units	
Drain-source breakdown voltage	V _{(BR)DSS}	I _D =1mA V _{GS} =0V	-60			V	
Gate threshold voltage	V _{GS(th)}	I _D =1mA V _{DS} =V _{GS}	-1.0	-1.5	-2.5	V	
Zero gate voltage drain current	I _{DSS}	V _{DS} = -60V V _{GS} =0V	T _{ch} =25°C	-10	-500	μA	
			T _{ch} =125°C	-0.2	-1.0	mA	
Gate-source leakage current	I _{GSS}	V _{GS} =±20V V _{DS} =0V		10	100	nA	
Drain-source on-state resistance	R _{DS(on)}	I _D = -2.5A	V _{GS} = -4V	280	480	mΩ	
			V _{GS} = -10V	200	300	mΩ	
Forward transconductance	g _{fs}	I _D =2.5A V _{DS} = -25V	2.0	4.5		S	
Input capacitance	C _{iss}	V _{DS} = -25V		500	750	pF	
Output capacitance	C _{oss}	V _{GS} =0V		200	300		
Reverse transfer capacitance	C _{rss}	f=1MHz		120	180		
Turn-on time t _{on} (t _{on} =t _{d(on)} +t _r)	t _{d(on)} t _r	V _{CC} = -30V R _G =25 Ω I _D = -3A	V _{GS} = -10V		15	23	ns
					20	30	
Turn-off time t _{off} (t _{off} =t _{d(off)} +t _f)	t _{d(off)} t _f				100	150	
					80	120	
Avalanche capability	I _{AV}	L=100μH T _{ch} =25°C	-5			A	
Continuous reverse drain current	I _{DR}	T _c =25°C			-5	A	
Pulsed reverse drain current	I _{DRM}	T _c =25°C			-20	A	
Diode forward on-voltage	V _{SD}	I _F =2xI _{DR} V _{GS} =0V T _{ch} =25°C		-4.0		V	
Reverse recovery time	t _{rr}	I _F =I _{DR} V _{GS} =0V		80		ns	
Reverse recovery charge	Q _{rr}	-di/dt=100A/μs T _{ch} =25°C		0.18		μC	

Thermal characteristics

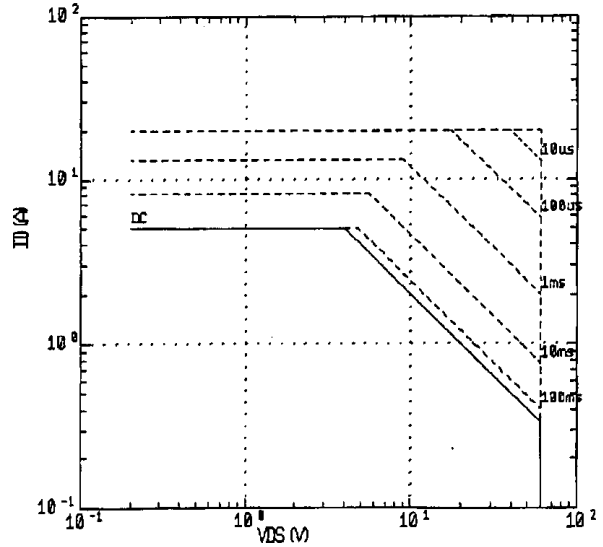
Item	Symbol	Min.	Typ.	Max.	Units
Thermal resistance	R _{th(ch-c)}			6.25	°C/W
	R _{th(ch-a)}			125.0	°C/W

Characteristics

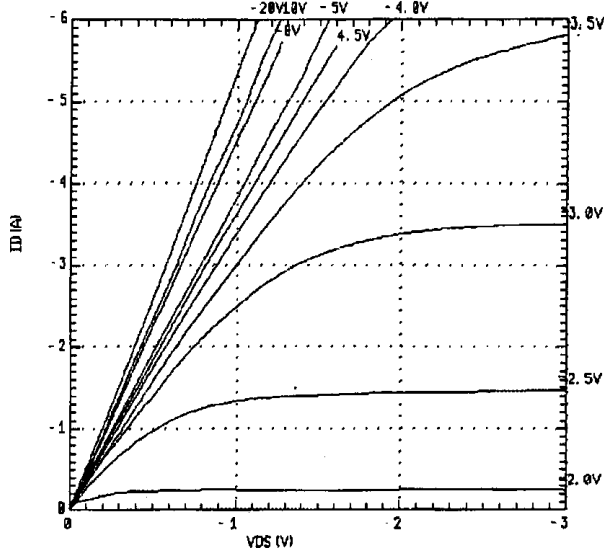
Power Dissipation
 $P_D = f(T_C)$



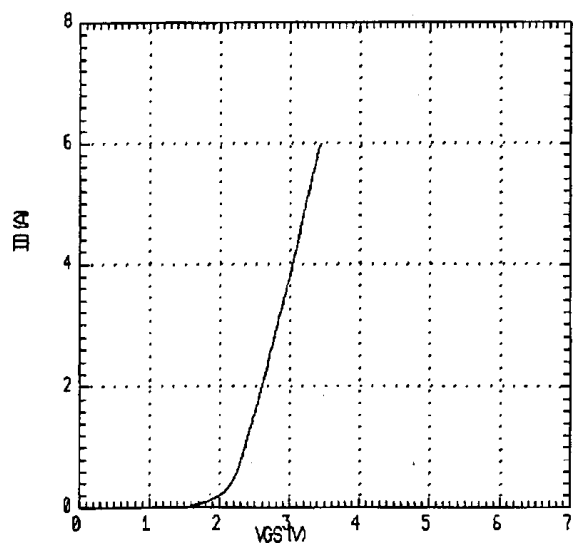
Safe operating area
 $I_D = f(V_{DS}) : D=0.01, T_c=25^\circ C$



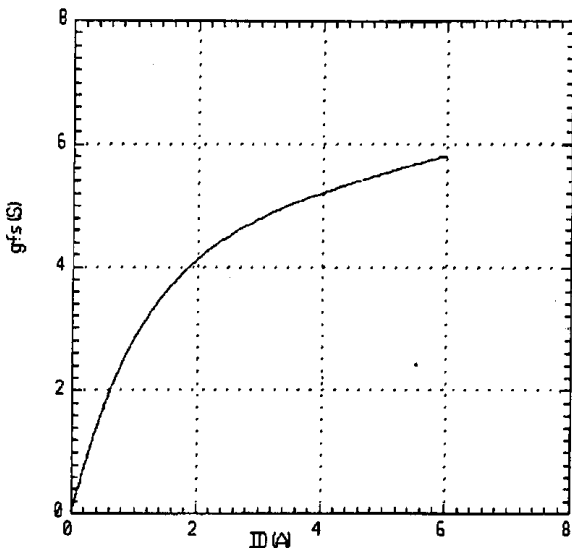
Typical output characteristics
 $I_D = f(V_{DS}) : 80\mu s$ pulse test, $T_{ch}=25^\circ C$



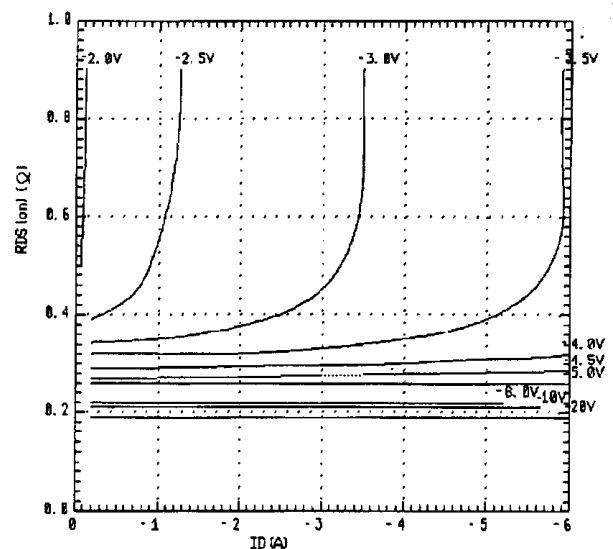
Typical Transfer Characteristic
 $I_D = f(V_{GS}) : 80\mu s$ pulse test, $V_{DS}=25V$



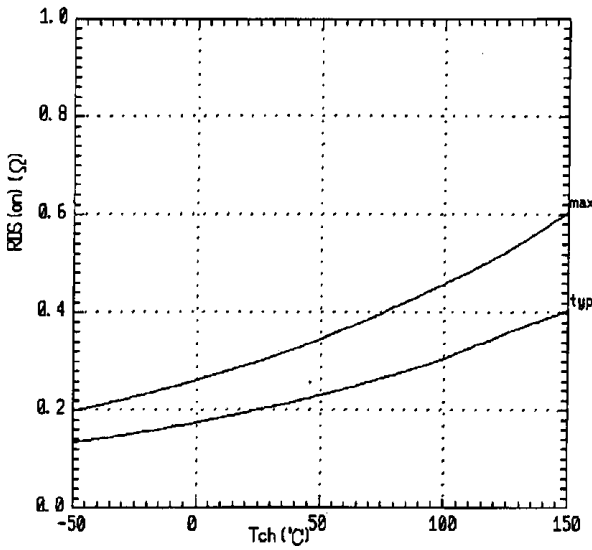
Typical Transconductance
 $g_{fs} = f(I_D) : 80\mu s$ pulse test, $V_{DS}=25V, T_J=25^\circ C$



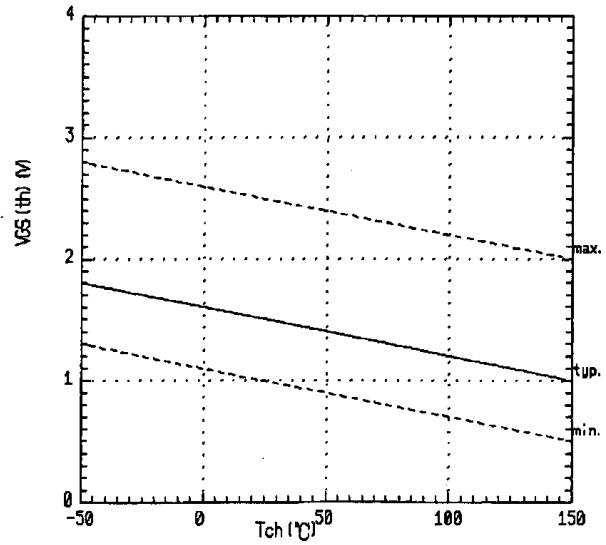
Typical Drain-source on-state resistance
 $R_{DS(on)} = f(I_D) : 80\mu s$ pulse test, $T_{ch}=25^\circ C$



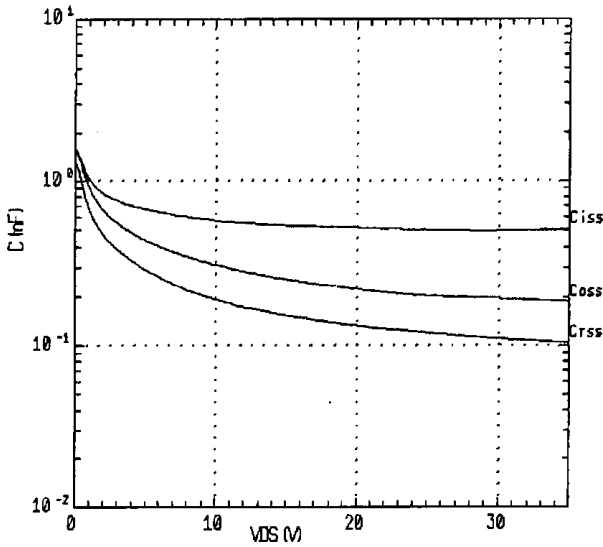
Drain-source on-state resistance
 $R_{DS(on)} = f(T_{ch}) : I_D = 2.5A, V_{GS} = 10V$



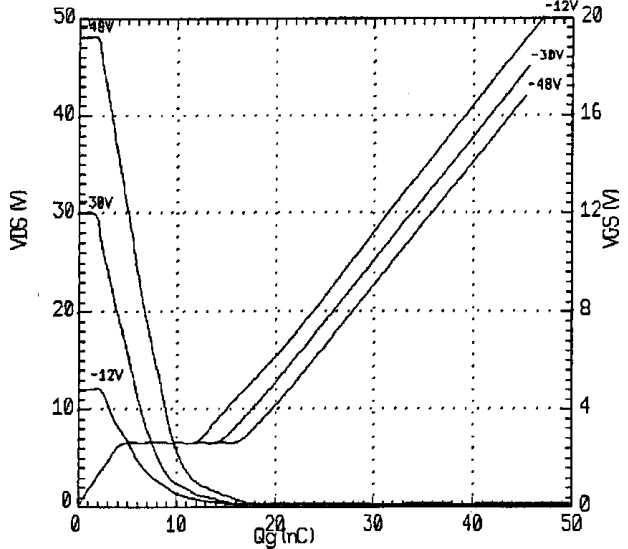
Gate threshold voltage
 $V_{GS(th)} = f(T_{ch}) : V_{DS} = V_{GS}, I_D = 1mA$



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



Typical gate charge characteristics
 $V_{GS} = f(Q_g) : I_D = 3A$



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

