

## P-CHANNEL SILICON POWER MOSFET

## FAP-III SERIES

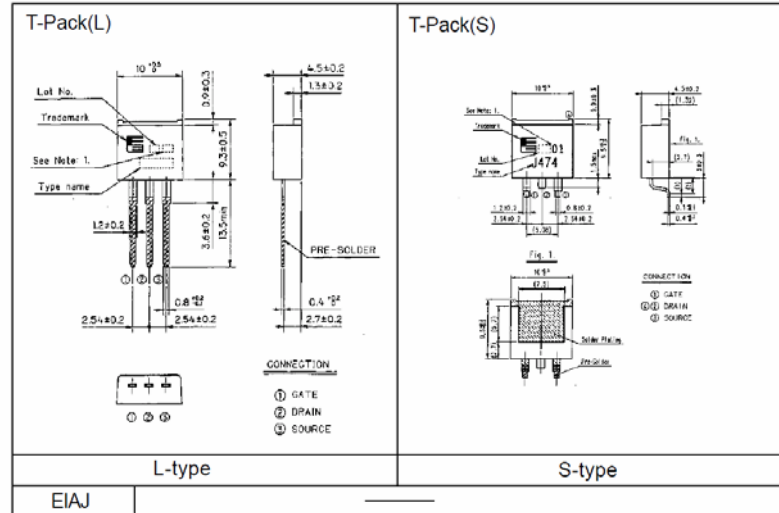
### Features

- 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



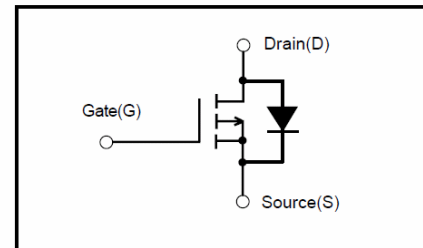
### Maximum ratings and characteristics

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

Item	Symbol	Rating	Unit
Drain-source voltage	V <sub>DS</sub>	-60	V
Continuous drain current	I <sub>D</sub>	±7	A
Pulsed drain current	I <sub>D(puls)</sub>	±28	A
Gate-source voltage	V <sub>GS</sub>	±20	V
Maximum avalanche energy *1	E <sub>AV</sub>	110.8	mJ
Maximum power dissipation(Tc=25°C)	P <sub>D</sub>	20	W
Operating and storage temperature range	T <sub>ch</sub> T <sub>stg</sub>	+150 -55 to +150	°C

\*1 L=3.02mH, V<sub>CC</sub>=-24V

### Equivalent circuit schematic



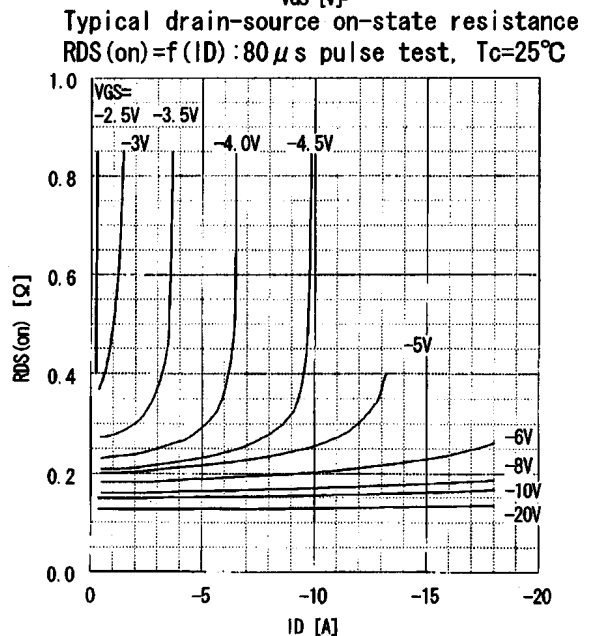
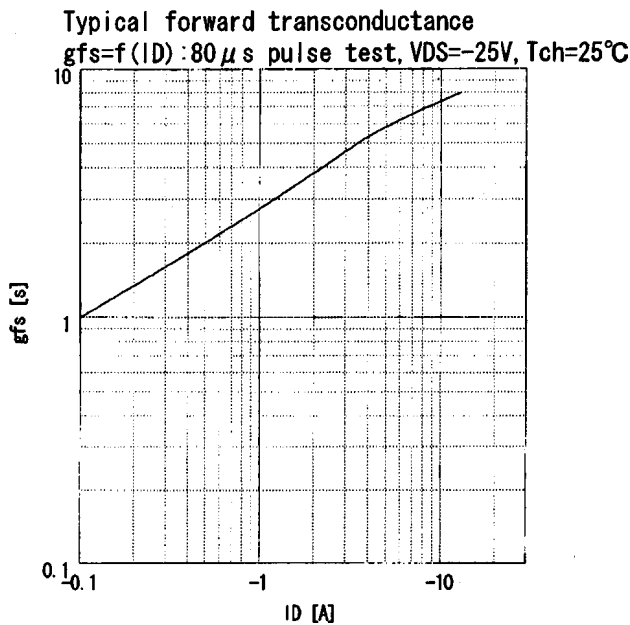
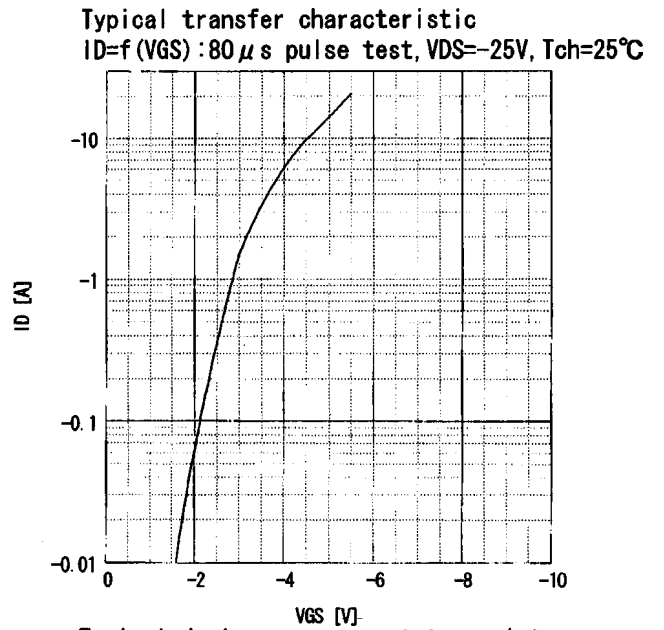
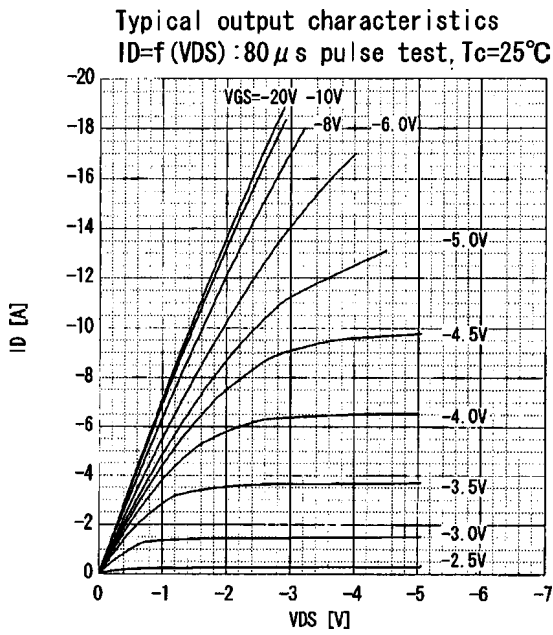
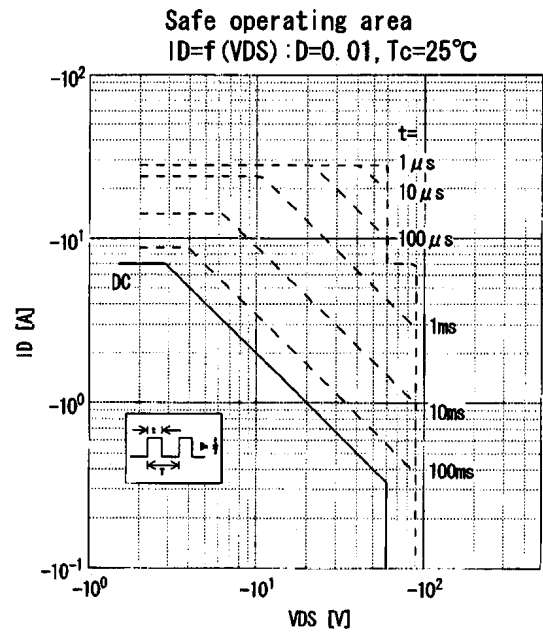
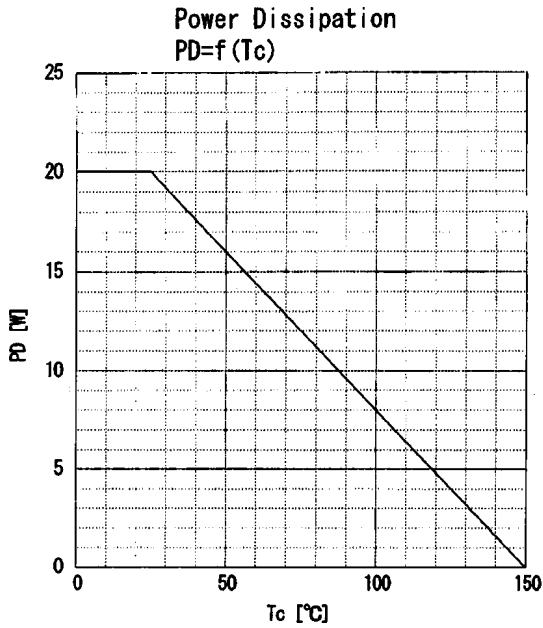
- Electrical characteristics (Tc =25°C unless otherwise specified)

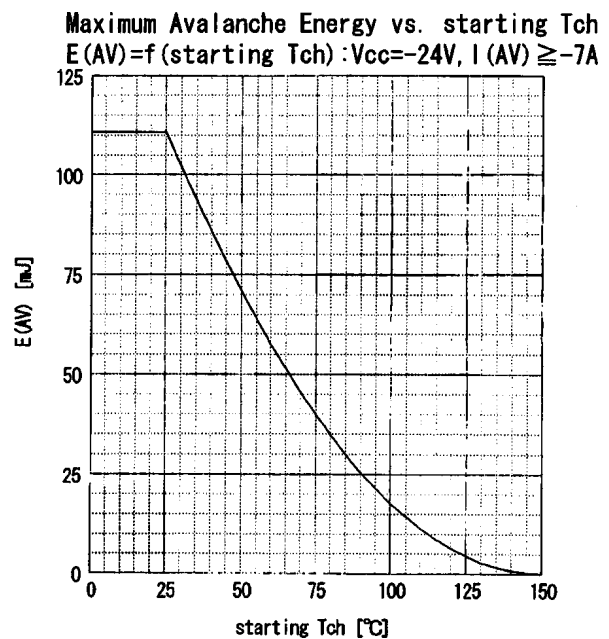
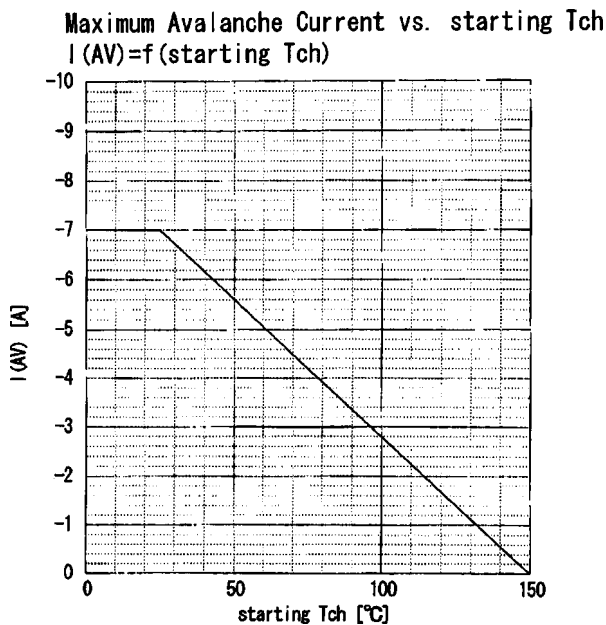
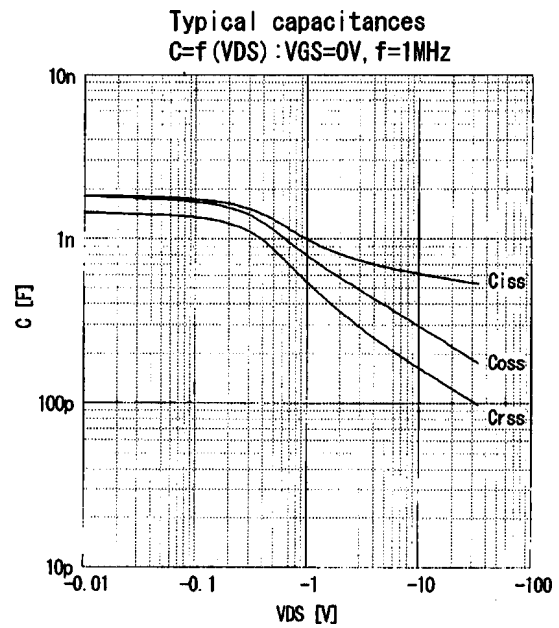
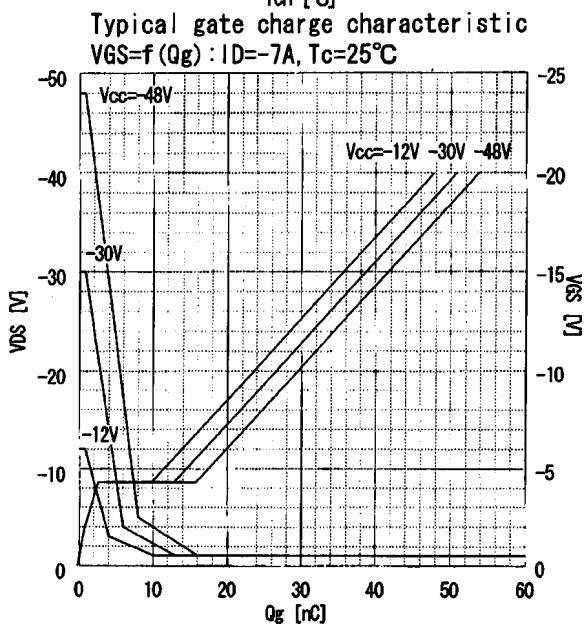
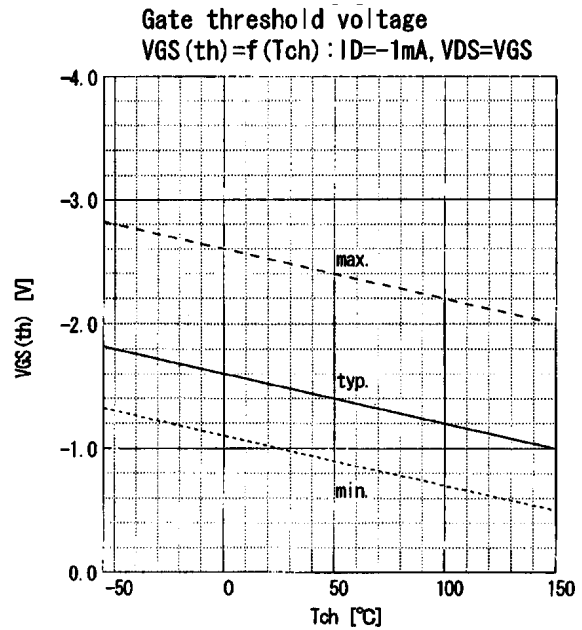
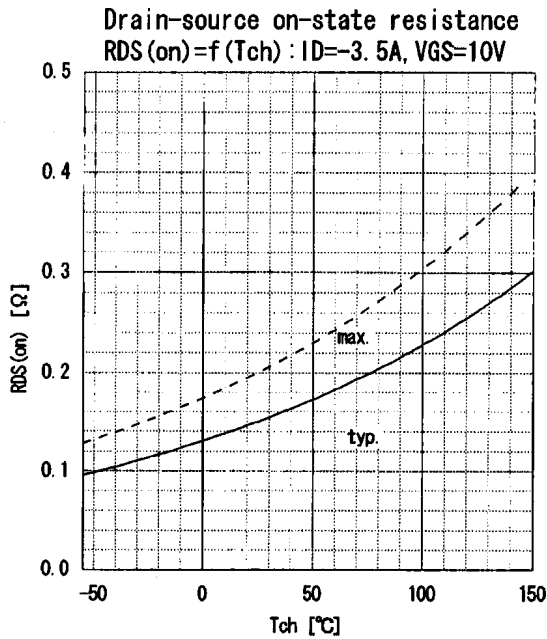
Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	BV <sub>DSS</sub>	I <sub>D</sub> =1mA V <sub>GS</sub> =0V	-60			V
Gate threshold voltage	V <sub>GS(th)</sub>	I <sub>D</sub> =1mA V <sub>DS</sub> =V <sub>GS</sub>	-1.0	-1.5	-2.5	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =-60V V <sub>GS</sub> =0V		-10	-500	μA
			T <sub>ch</sub> =25°C		-0.2	-1.0
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> =-3.5A	V <sub>GS</sub> =-4V	260	350	mΩ
			V <sub>GS</sub> =-10V	150	200	mΩ
Forward transconductance	g <sub>fs</sub>	I <sub>D</sub> =3.5A V <sub>DS</sub> =-25V	2.5	5.0		S
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-25V		550	830	pF
Output capacitance	C <sub>oss</sub>	V <sub>GS</sub> =0V		200	300	
Reverse transfer capacitance	C <sub>rss</sub>	f=1MHz		110	170	
Turn-on time	t <sub>d(on)</sub> t <sub>r</sub>	V <sub>CC</sub> =-30V R <sub>G</sub> =10 Ω I <sub>D</sub> =-7A		10	15	ns
			V <sub>GS</sub> =-10V		20	
Turn-off time	t <sub>d(off)</sub> t <sub>f</sub>	V <sub>GS</sub> =-10V		60	90	
					25	50
Avalanche capability	I <sub>AV</sub>	L=100μH T <sub>ch</sub> =25°C	-7			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		-2.50	-3.8	V
Reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> =I <sub>DR</sub> V <sub>GS</sub> =0V		110		ns
Reverse recovery charge	Q <sub>rr</sub>	-di/dt=100A/μs T <sub>ch</sub> =25°C		0.50		μC

### Thermal characteristics

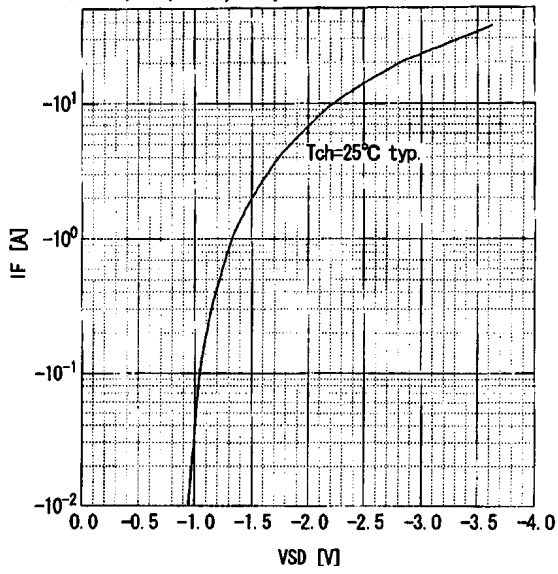
Item	Symbol	Min.	Typ.	Max.	Units
Thermal resistance	R <sub>th(ch-c)</sub>			6.25	°C/W
	R <sub>th(ch-a)</sub>			125.0	°C/W

Characteristics





Forward characteristic of reverse of diode  
 $I_F=f(V_{SD}) : 80 \mu s$  pulses test,  $V_{GS}=0V$



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

