

P-CHANNEL SILICON POWER MOSFET

FAP-III SERIES

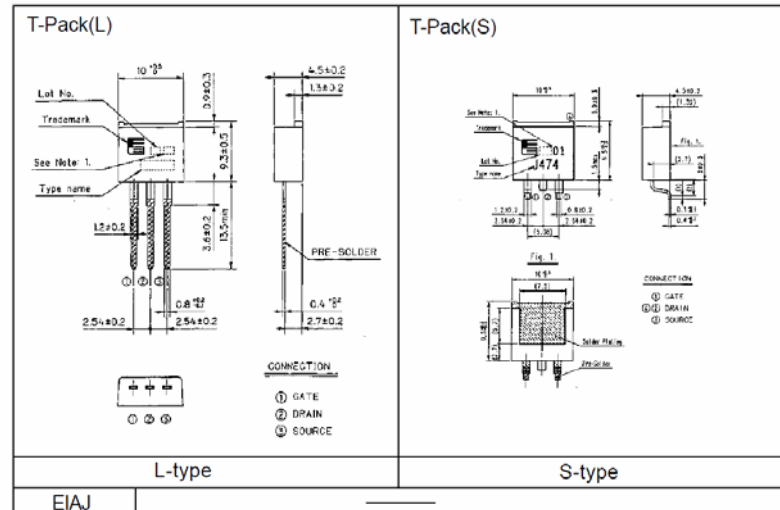
Features

- 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



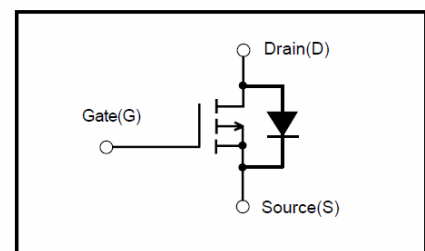
Maximum ratings and characteristics

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

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

*1 L=3.02mH, V_{CC}= -24V

Equivalent circuit schematic



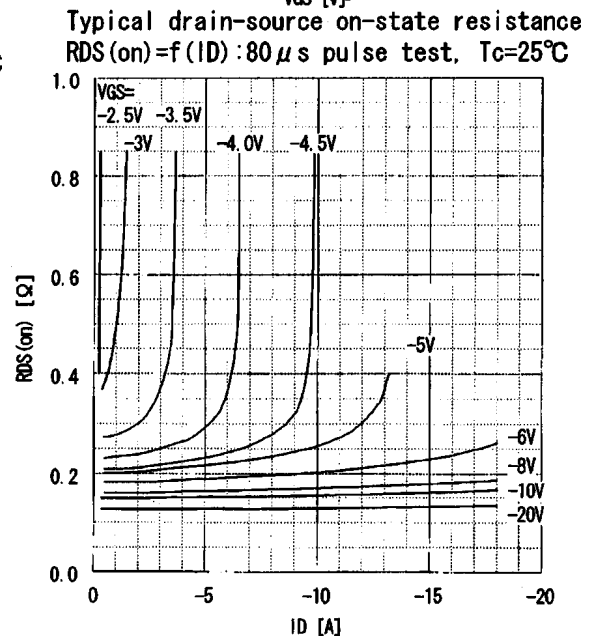
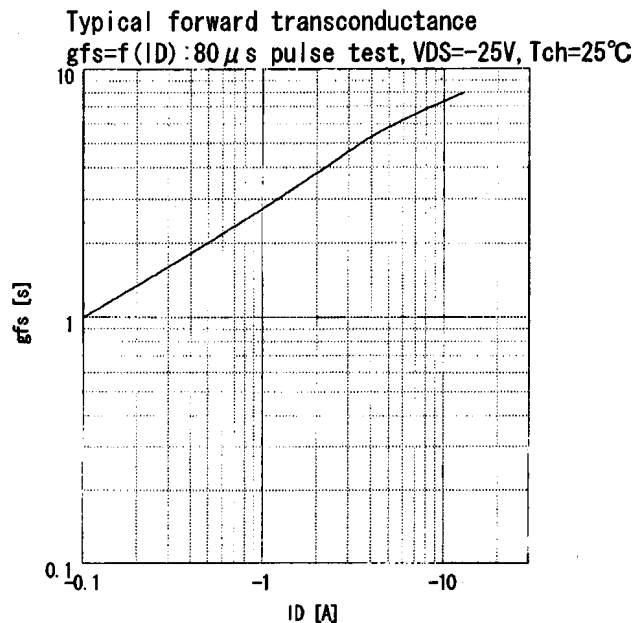
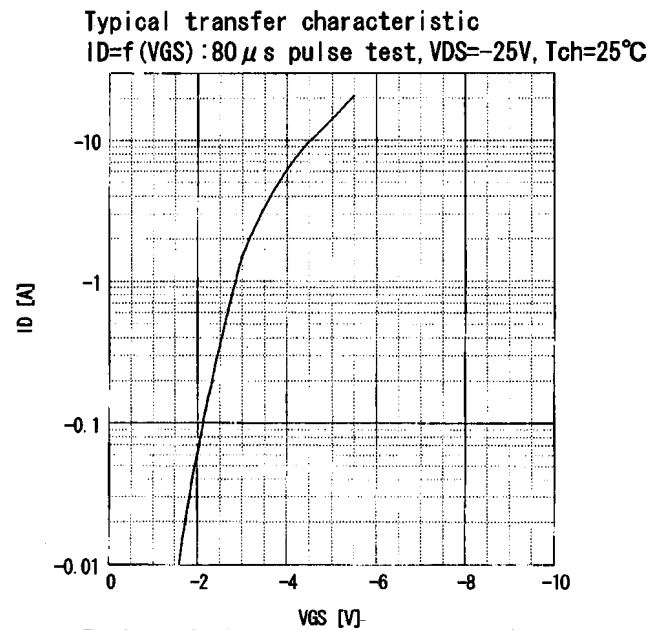
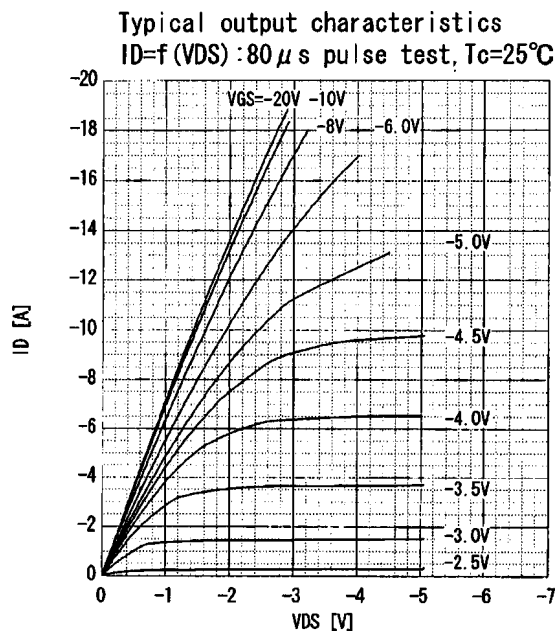
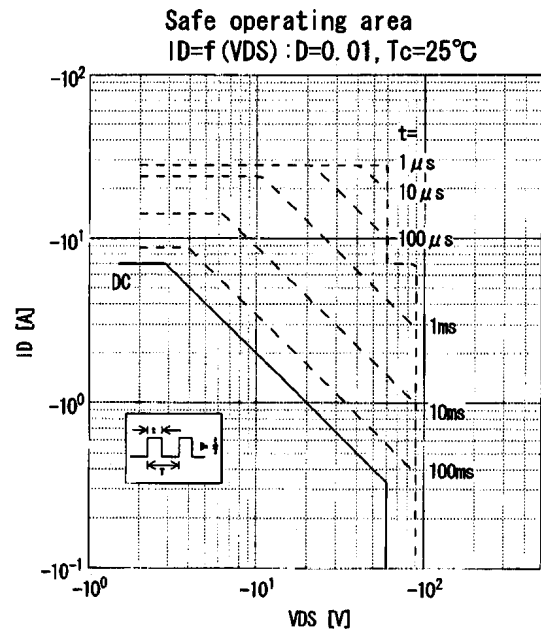
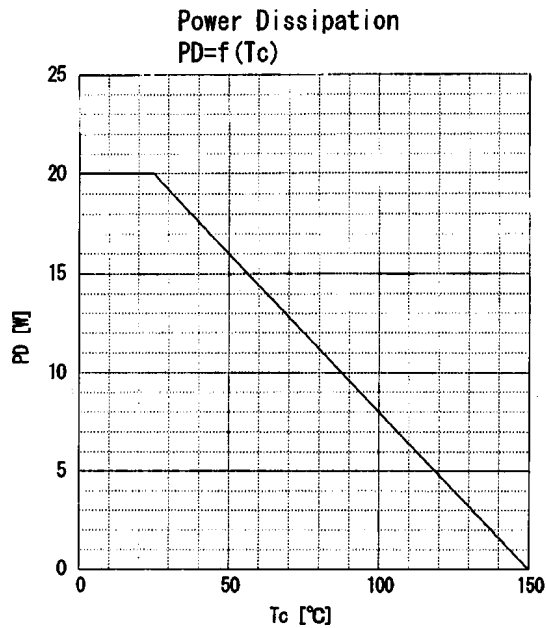
Electrical characteristics (Tc =25°C unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	BV _{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 T _{ch} =25°C		-10	-500	μA
		V _{GS} =0V 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 = -3.5A V _{GS} = -4V		260	350	mΩ
		V _{GS} = -10V		150	200	mΩ
Forward transconductance	g _{fs}	I _D =3.5A V _{DS} = -25V	2.5	5.0		S
Input capacitance	C _{iss}	V _{DS} = -25V		550	830	pF
Output capacitance	C _{oss}	V _{GS} =0V		200	300	pF
Reverse transfer capacitance	C _{rss}	f=1MHz		110	170	pF
Turn-on time	t _{d(on)}	V _{CC} = -30V R _G =10 Ω		10	15	ns
		I _D = -7A		20	30	ns
Turn-off time	t _{d(off)}	V _{GS} = -10V		60	90	ns
				25	50	ns
Avalanche capability	I _{AV}	L=100μH T _{ch} =25°C	-7			A
Diode forward on-voltage	V _{SD}	I _F =2I _{DR} V _{GS} =0V T _{ch} =25°C		-2.50	-3.8	V
Reverse recovery time	t _{rr}	I _F =I _{DR} V _{GS} =0V		110		ns
Reverse recovery charge	Q _{rr}	-di/dt=100A/μs T _{ch} =25°C		0.50		μC

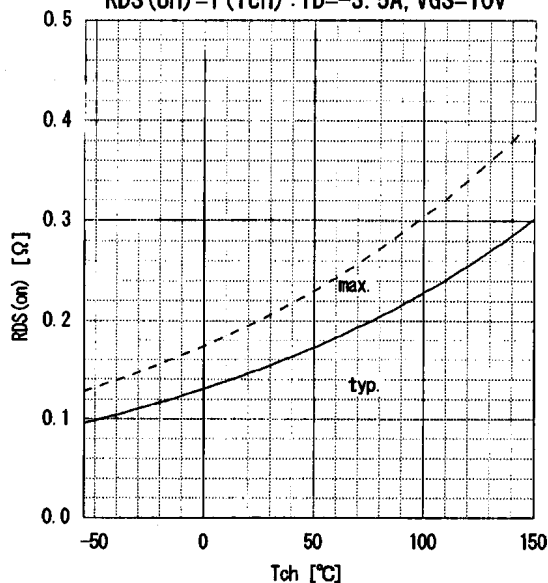
Thermal characteristics

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

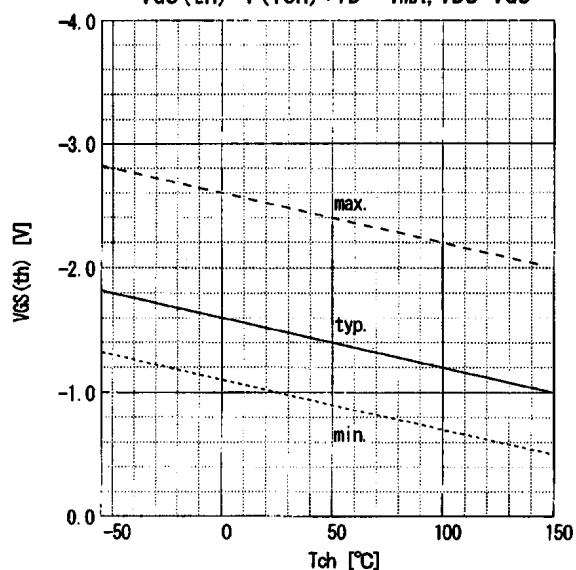
Characteristics



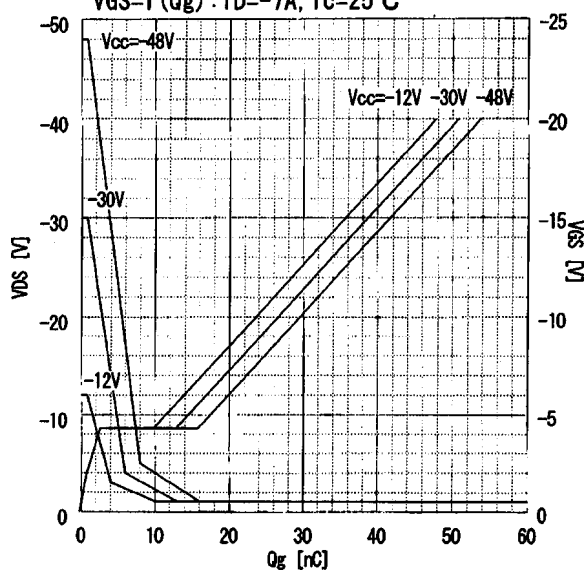
Drain-source on-state resistance
 $R_{DS(on)} = f(T_{ch}) : I_D = -3.5A, V_{GS} = 10V$



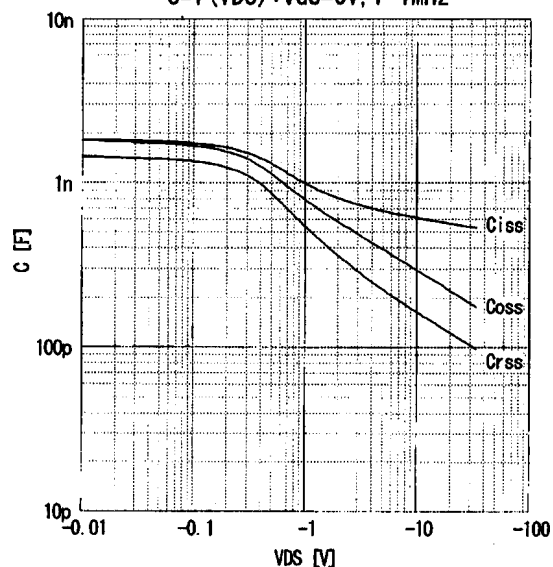
Gate threshold voltage
 $V_{GS(th)} = f(T_{ch}) : I_D = -1mA, V_{DS} = V_{GS}$



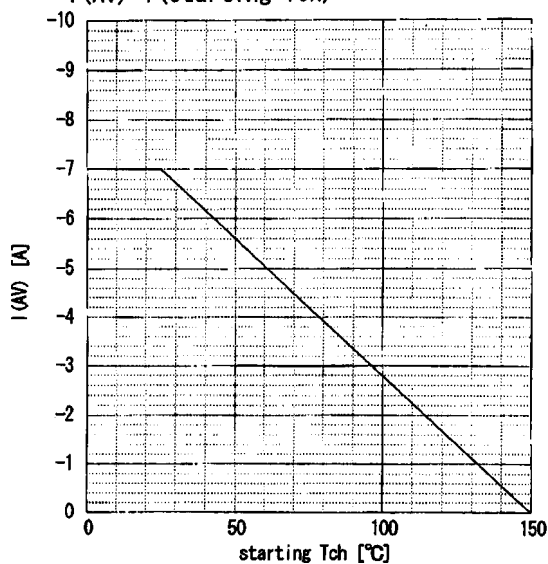
Typical gate charge characteristic
 $V_{GS} = f(Q_g) : I_D = -7A, T_c = 25°C$



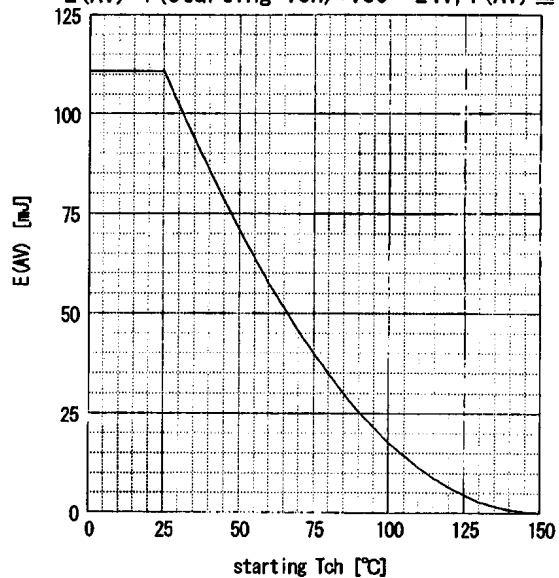
Typical capacitances
 $C = f(V_{DS}) : V_{GS} = 0V, f = 1MHz$



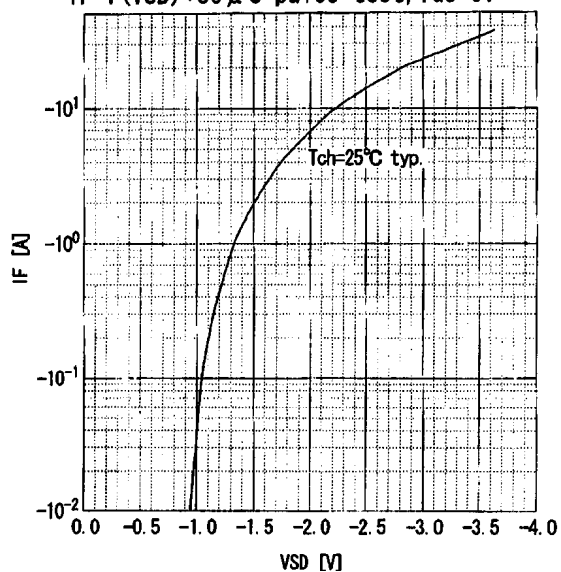
Maximum Avalanche Current vs. starting T_{ch}
 $I_{(AV)} = f(\text{starting } T_{ch})$



Maximum Avalanche Energy vs. starting T_{ch}
 $E_{(AV)} = f(\text{starting } T_{ch}) : V_{GS} = -24V, I_{(AV)} \geq -7A$



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: $D = t/T$ 