

## N-CHANNEL SILICON POWER MOSFET

## FAP-IIS SERIES

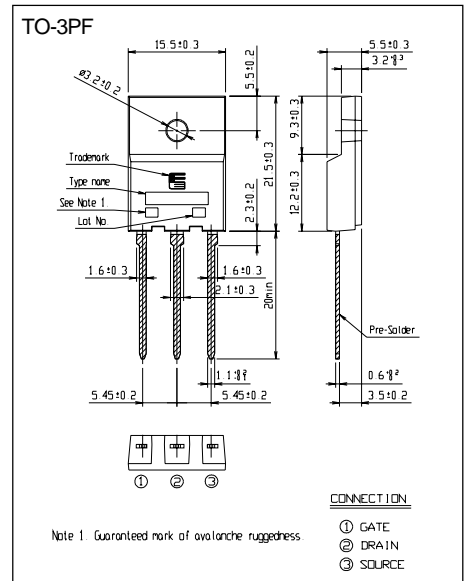
### Features

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

### Applications

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

### Outline Drawings



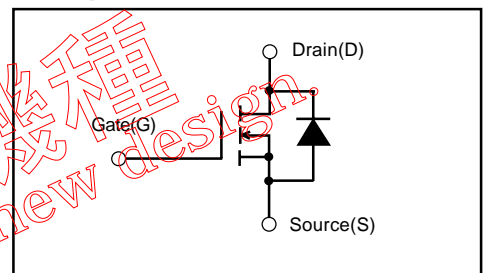
### Maximum ratings and characteristics

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

Item	Symbol	Rating	Unit	Remarks
Drain-source voltage	V <sub>DS</sub>	600	V	
Continuous drain current	I <sub>D</sub>	±10	A	
Pulsed drain current	I <sub>D</sub> [puls]	±36	A	
Gate-source peak voltage	V <sub>GS</sub>	±35	V	
Repetitive or non-repetitive	I <sub>AR</sub>	10	A	T <sub>ch</sub> ≤ 150°C
Maximum avalanche energy	E <sub>AV</sub>	433.7	mJ	*1
Maximum power dissipation	P <sub>D</sub>	80	W	
Operating and storage temperature range	T <sub>ch</sub> T <sub>stg</sub>	+150 -55 to +150	°C	

\*1 L=7.95mH, V<sub>cc</sub>=60V

### Equivalent circuit schematic



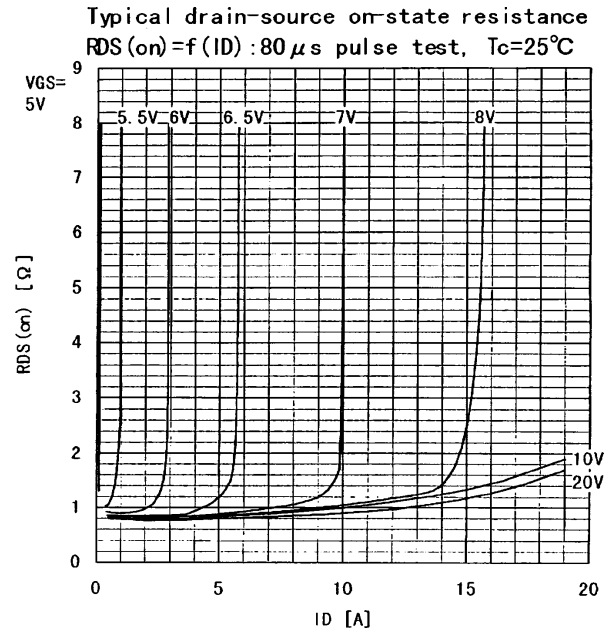
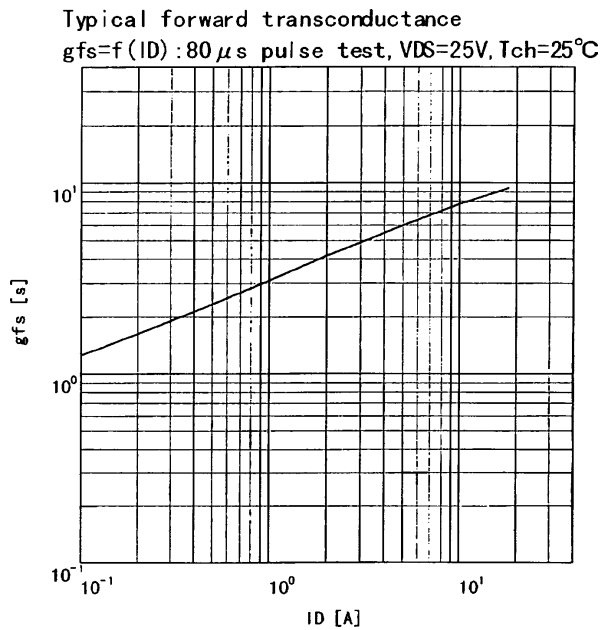
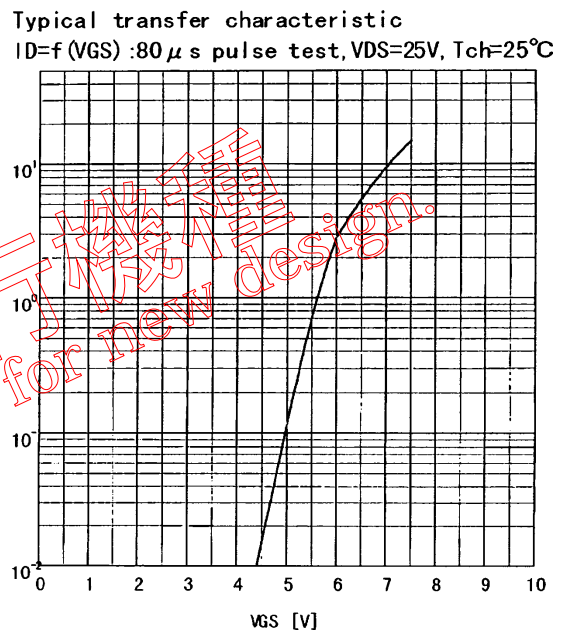
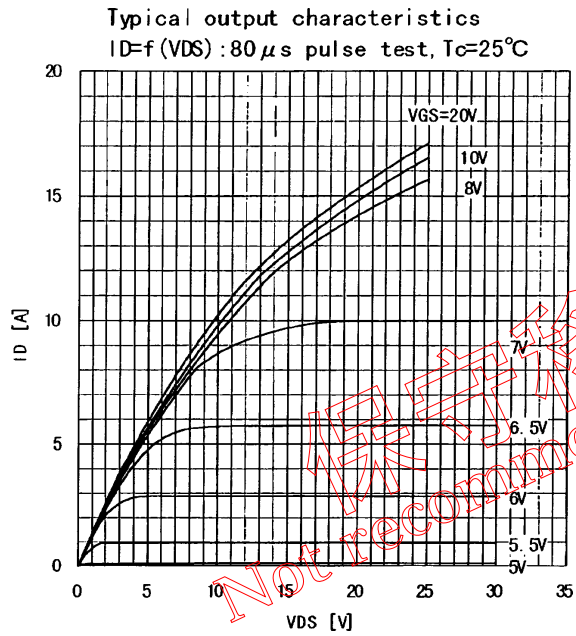
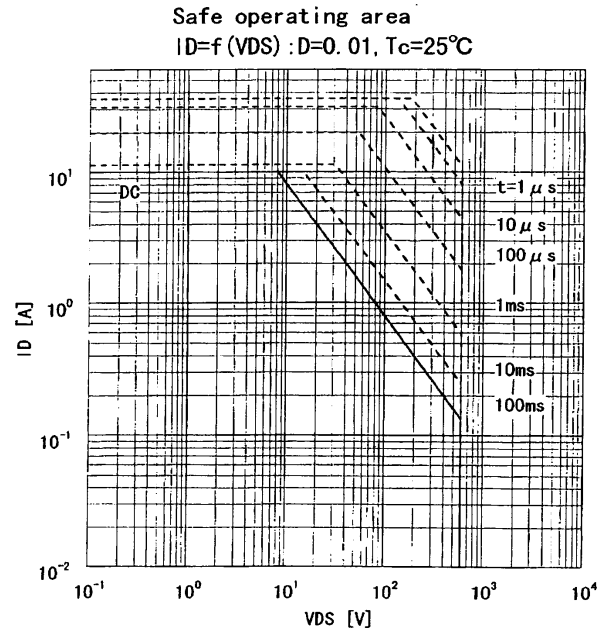
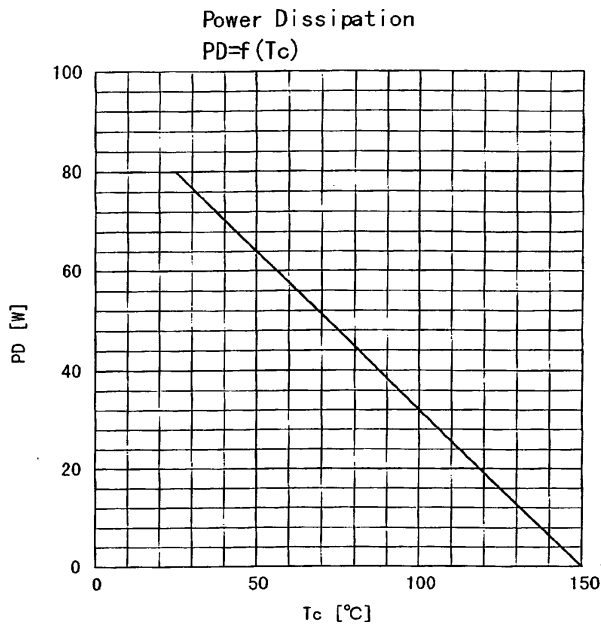
#### Electrical characteristics (Tc = 25°C unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units	
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> =1mA V <sub>GS</sub> =0V	600			V	
Gate threshold voltage	V <sub>GS(th)</sub>	I <sub>D</sub> =1mA V <sub>DS</sub> =V <sub>GS</sub>	3.5	4.0	4.5	V	
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =600V V <sub>GS</sub> =0V	T <sub>ch</sub> =25°C		10	500	μA
			T <sub>ch</sub> =125°C		0.2	1.0	mA
Gate-source leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±30V V <sub>DS</sub> =0V		10	100	nA	
Drain-source on-state resistance	R <sub>DS(on)</sub>	I <sub>D</sub> =5A V <sub>GS</sub> =10V		0.85	1.0	Ω	
Forward transconductance	g <sub>fs</sub>	I <sub>D</sub> =5A V <sub>DS</sub> =25V	3.0	6.0		S	
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V		1100	1700	pF	
Output capacitance	C <sub>oss</sub>	V <sub>GS</sub> =0V		170	260		
Reverse transfer capacitance	C <sub>rss</sub>	f=1MHz		75	120		
Turn-on time	td(on)	V <sub>CC</sub> =300V R <sub>G</sub> =10 Ω		25	40	ns	
	t <sub>r</sub>	I <sub>D</sub> =10A		70	110		
Turn-off time	td(off)	V <sub>GS</sub> =10V		75	120		
	t <sub>f</sub>			40	60		
Avalanche capability	I <sub>AV</sub>	L=1.19mH T <sub>ch</sub> =25°C	10			A	
Diode forward on-voltage	V <sub>SD</sub>	I <sub>F</sub> =2xI <sub>DR</sub> V <sub>GS</sub> =0V T <sub>ch</sub> =25°C		1.0	1.5	V	
Reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> =I <sub>DR</sub> V <sub>GS</sub> =0V		500		ns	
Reverse recovery charge	Q <sub>rr</sub>	-di/dt=100A/μs T <sub>ch</sub> =25°C		6.5		μC	

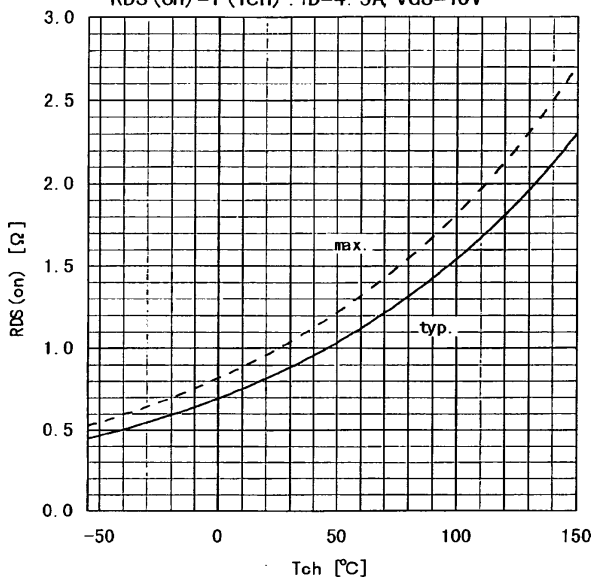
### Thermal characteristics

Item	Symbol	Min.	Typ.	Max.	Units
Thermal resistance	R <sub>th(ch-c)</sub>			1.56	°C/W
	R <sub>th(ch-a)</sub>			30.0	°C/W

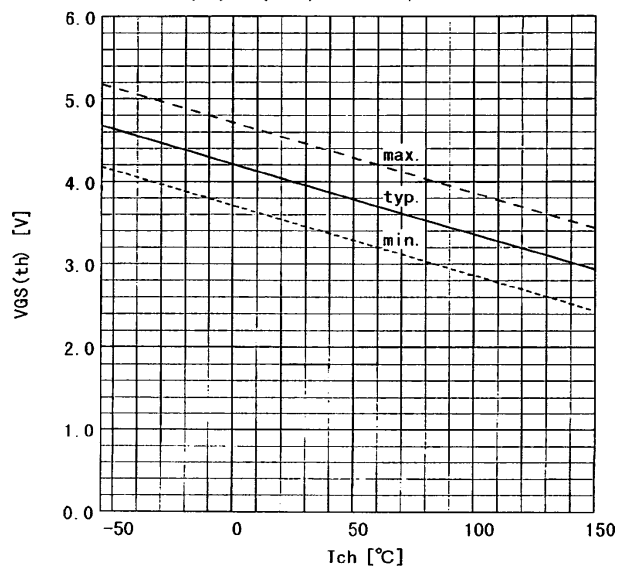
Characteristics



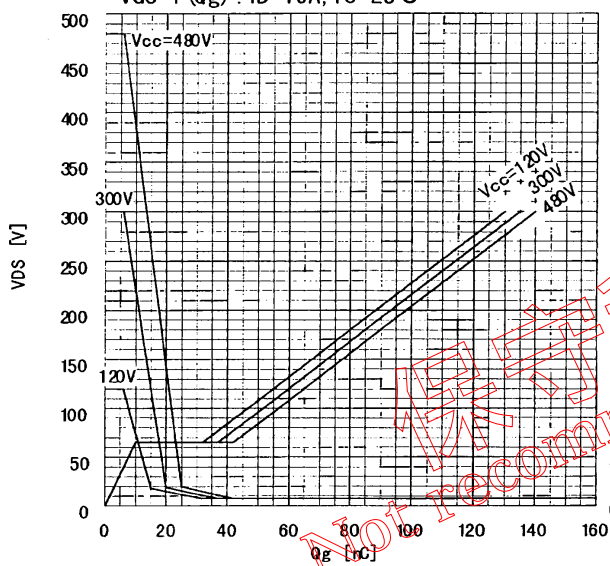
Drain-source on-state resistance  
 $R_{DS(on)} = f(T_{ch}) : I_D = 4.5A, V_{GS} = 10V$



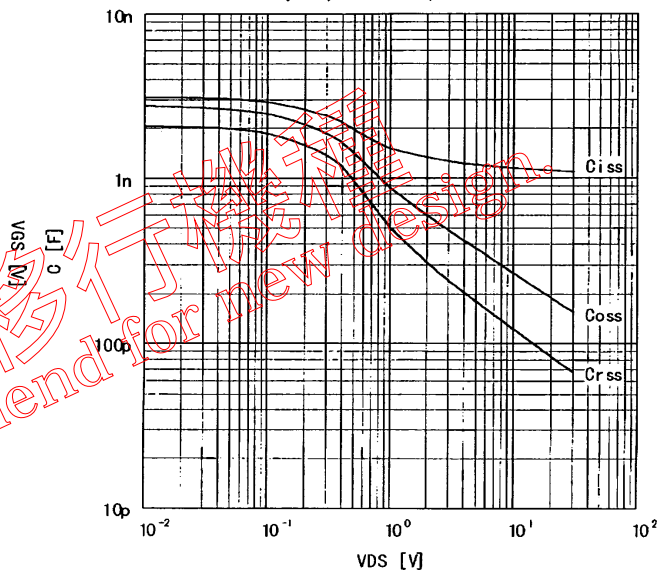
Gate threshold voltage  
 $V_{GS(th)} = f(T_{ch}) : I_D = 1mA, V_{DS} = V_{GS}$



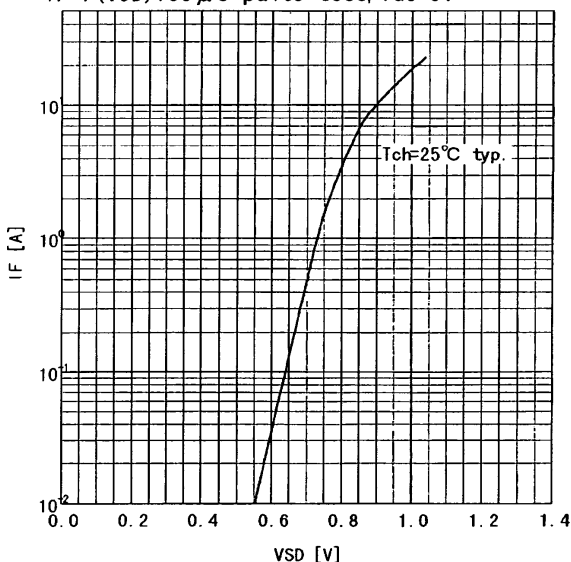
Typical gate charge characteristic  
 $V_{GS} = f(Q_g) : I_D = 10A, T_c = 25°C$



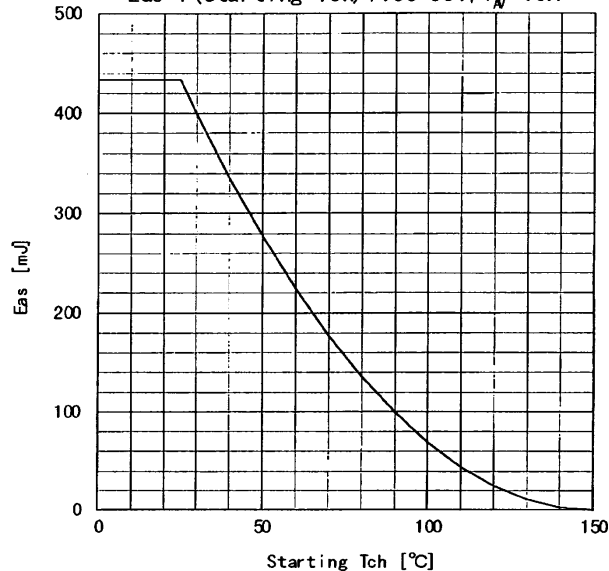
Typical capacitances  
 $C = f(V_{DS}) : V_{GS} = 0V, f = 1MHz$

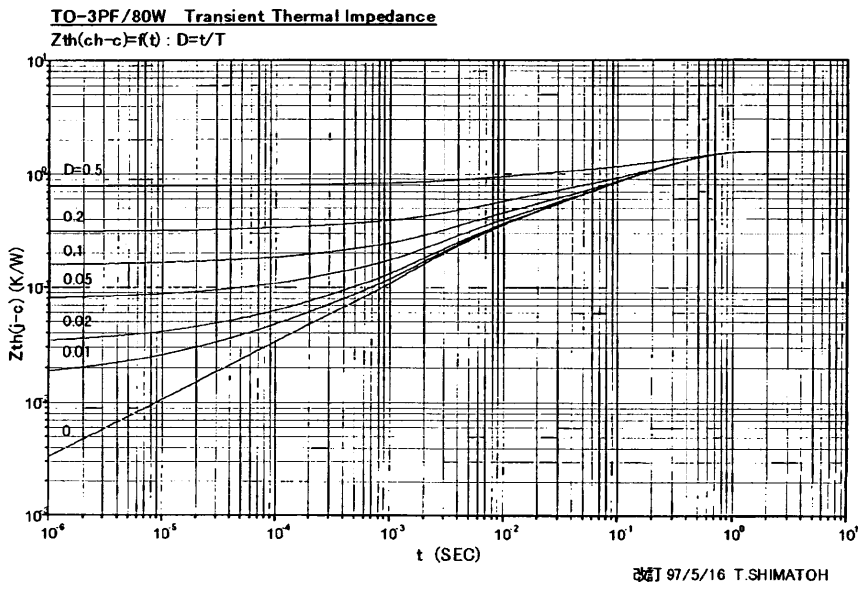


Forward characteristic of reverse of diode  
 $I_F = f(V_{SD}) : 80 \mu s \text{ pulses test}, V_{GS} = 0V$



Avalanche energy derating  
 $E_{as} = f(\text{starting } T_{ch}) : V_{CC} = 60V, I_A = 10A$





保守移行機種  
Not recommend for new design.