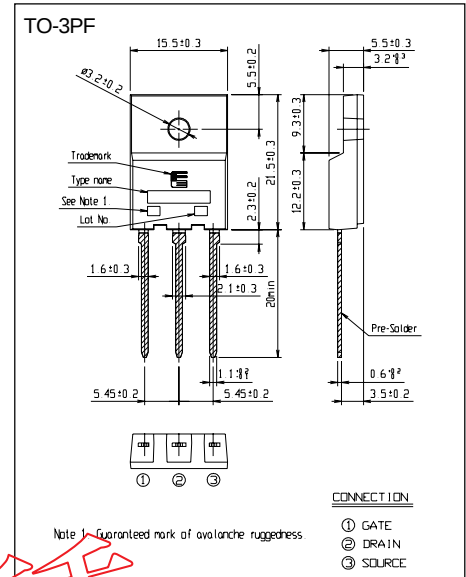


N-CHANNEL SILICON POWER MOSFET**FAP-IIIB SERIES****■ Features**

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

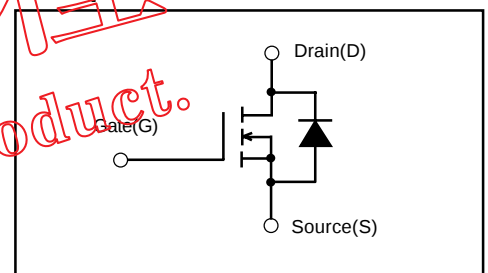
■ Applications

- 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_{DS}	30	V	
Continuous drain current	I_D	±100	A	
Pulsed drain current	$I_{D(puls)}$	±400	A	
Gate-source peak voltage	V_{GS}	±16	V	
Maximum avalanche energy	E_{AV}	2536.7	mJ	*1
Maximum power dissipation	P_D	150	W	
Operating and storage temperature range	T_{ch} T_{stg}	-55 to +150	°C	

*1 L=0.338mH, Vcc=12V

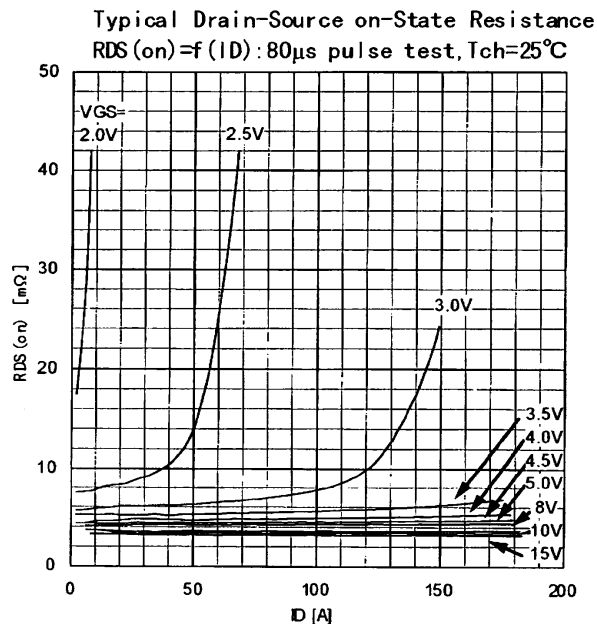
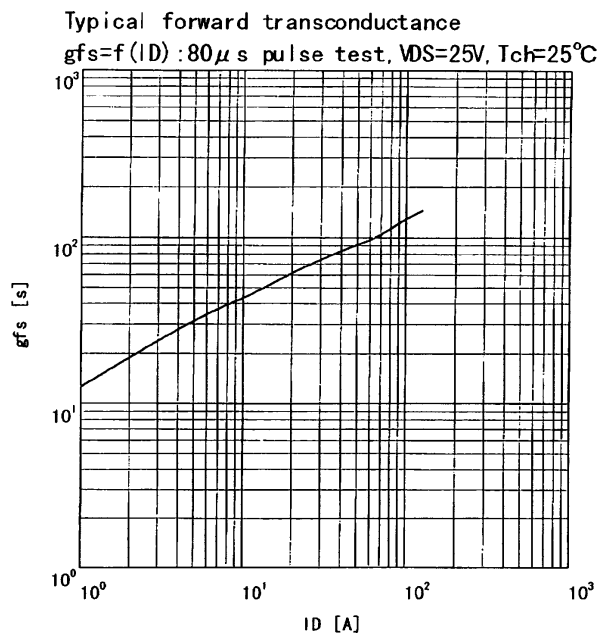
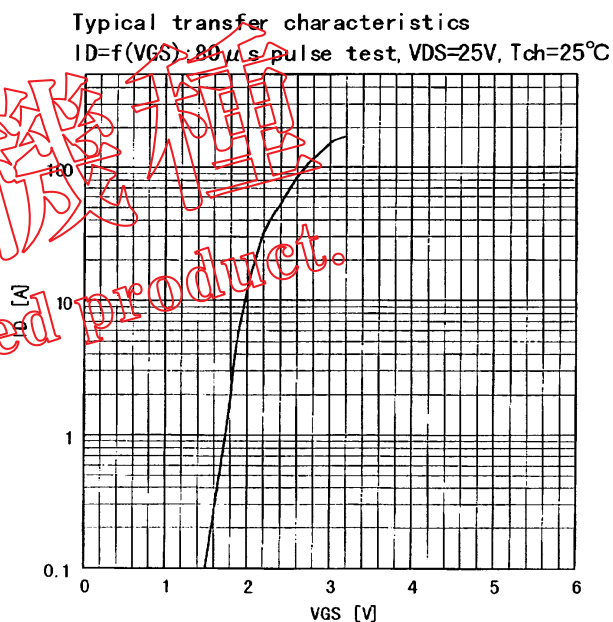
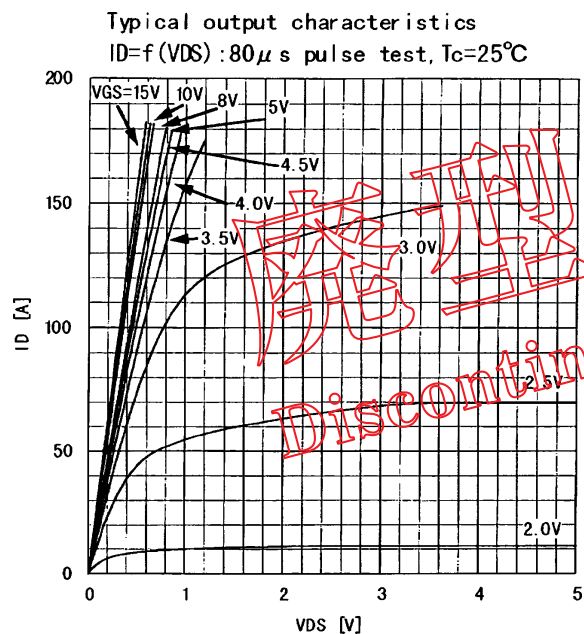
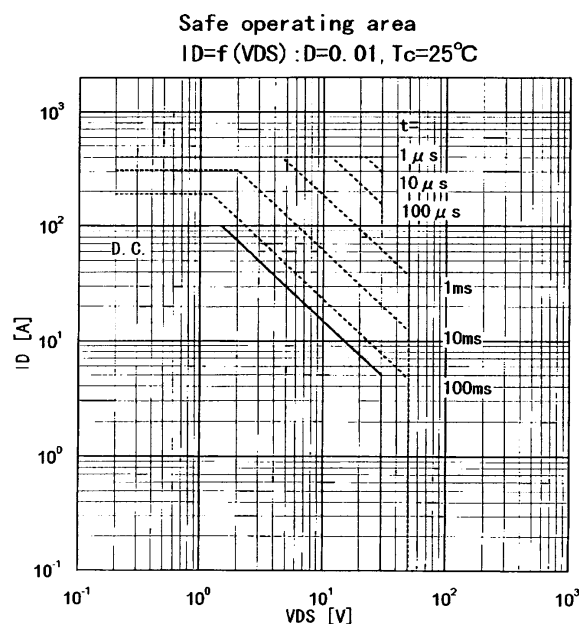
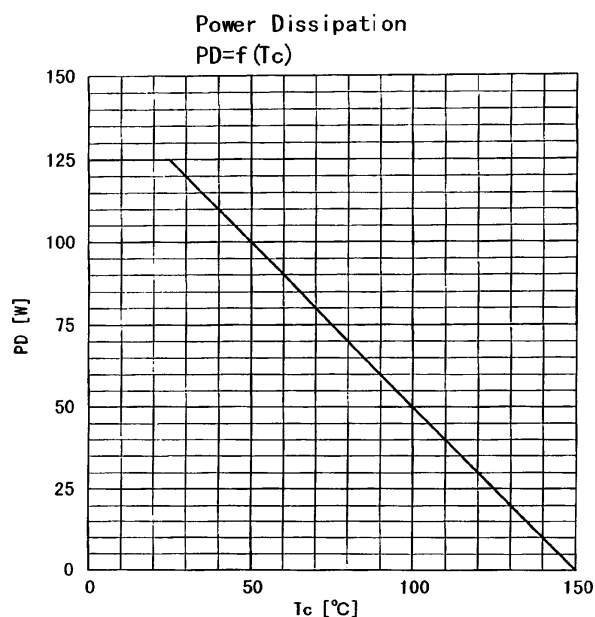
■ Equivalent circuit schematic**● Electrical characteristics (Tc =25°C unless otherwise specified)**

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D=1mA$ $V_{GS}=0V$	30			V
Gate threshold voltage	$V_{GS(th)}$	$I_D=1mA$ $V_{DS}=V_{GS}$	1.0	1.5	2.0	V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=30V$ $V_{GS}=0V$	$T_{ch}=25°C$	10	500	μA
			$T_{ch}=125°C$	0.2	1.0	mA
Gate-source leakage current	I_{GSS}	$V_{GS}=±16V$ $V_{DS}=0V$		10	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$I_D=50A$ $V_{GS}=10V$	$V_{GS}=4V$	4.8	7.0	mΩ
			$V_{GS}=10V$	3.2	4.0	mΩ
Forward transconductance	g_{fs}	$I_D=50A$ $V_{DS}=25V$	45	90		S
Input capacitance	C_{iss}	$V_{DS}=25V$		6600	9900	pF
Output capacitance	C_{oss}	$V_{GS}=0V$		3300	4950	
Reverse transfer capacitance	C_{rss}	$f=1MHz$		1400	2100	
Turn-on time	$t_{d(on)}$	$V_{CC}=15V$ $R_G=10Ω$		20	30	ns
	t_r			150	230	
Turn-off time	$t_{d(off)}$	$V_{GS}=10V$		470	710	
	t_f			370	560	
Avalanche capability	I_{AV}	$L=100μH$ $T_{ch}=25°C$	100			A
Diode forward on-voltage	V_{SD}	$I_F=100A$ $V_{GS}=0V$ $T_{ch}=25°C$		1.0	1.5	V
Reverse recovery time	t_{rr}	$I_F=50A$		95		ns
Reverse recovery charge	Q_{rr}	$-di/dt=100A/μs$ $T_{ch}=25°C$		0.22		μC

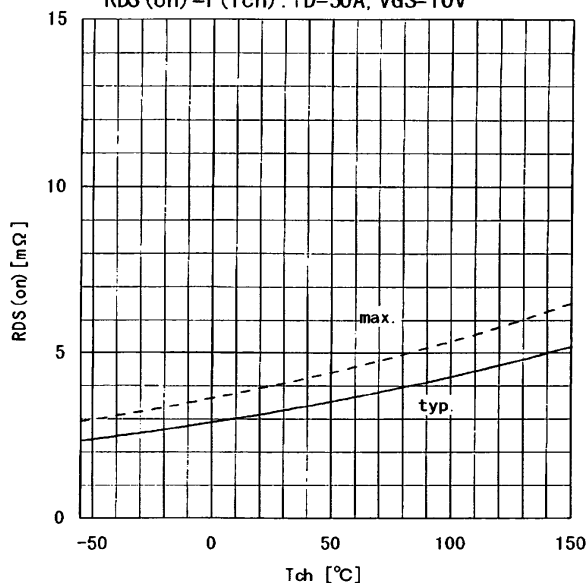
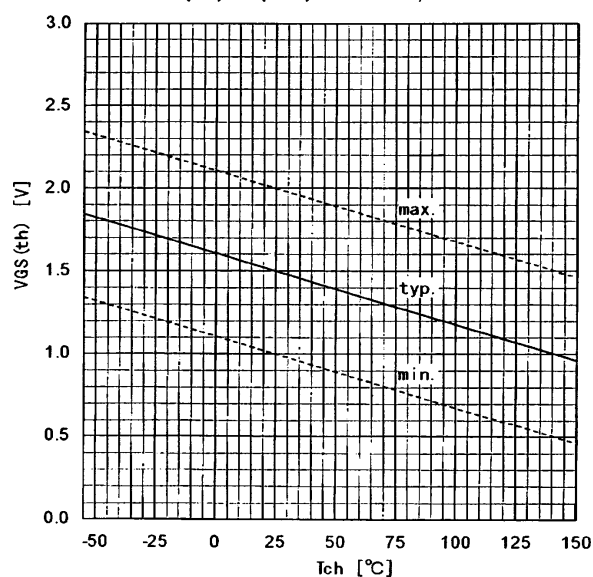
● Thermal characteristics

Item	Symbol	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-c)}$			1.0	°C/W
	$R_{th(ch-a)}$			30.0	°C/W

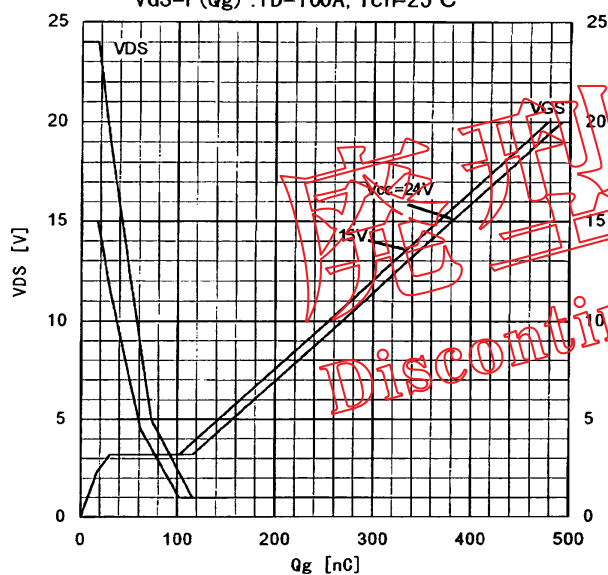
Characteristics



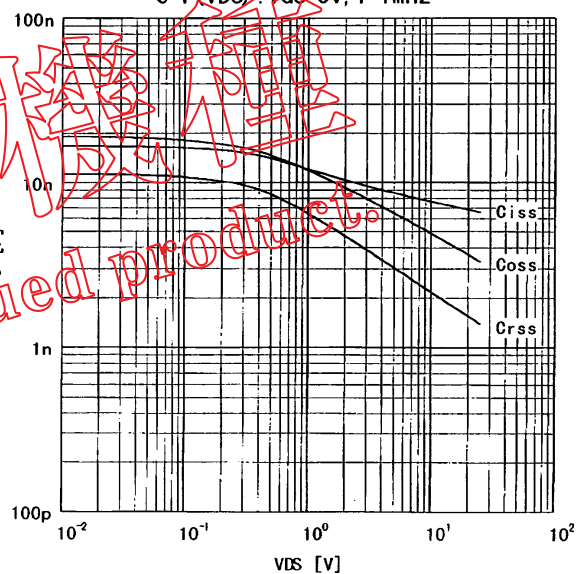
Drain-source on-state resistance

 $R_{DS(on)} = f(T_{ch}) : I_D = 50A, V_{GS} = 10V$ Gate Threshold Voltage vs. T_{ch} $V_{GS(th)} = f(T_{ch}) : V_{DS} = V_{GS}, I_D = 1mA$ 

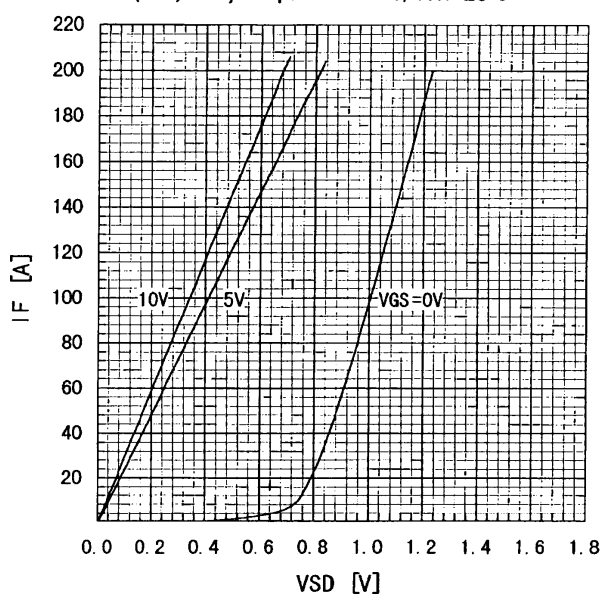
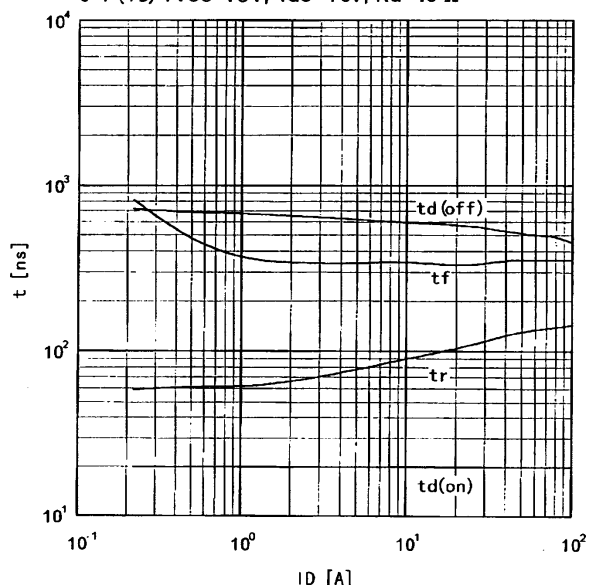
Typical Gate Charge Characteristics

 $V_{GS} = f(Q_g) : I_D = 100A, T_{ch} = 25^\circ C$ 

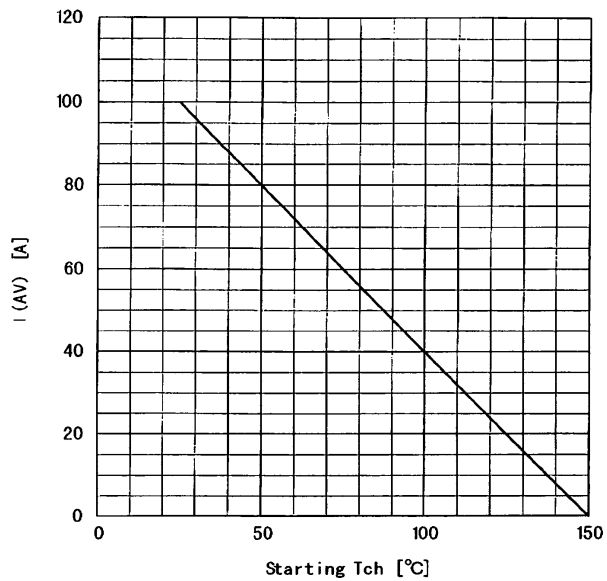
Typical capacitances

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

Typical Forward Characteristics of Reverse Diode

 $I_F = f(V_{SD}) : 80\mu s \text{ pulse test}, T_{ch} = 25^\circ C$ Typical Switching Characteristics vs. I_D $t = f(I_D) : V_{CC} = 15V, V_{GS} = 10V, R_G = 10\Omega$ 

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



Maximum Avalanche energy vs. starting Tch
 $E_{AS} = f(\text{starting Tch}) : V_{CC} = 12V, I_{AV} \leq 100A$

