2SK2689-01MR FUJI POWER MOSFET

N-CHANNEL SILICON POWER MOSFET

FAP-IIIB SERIES

■ Features

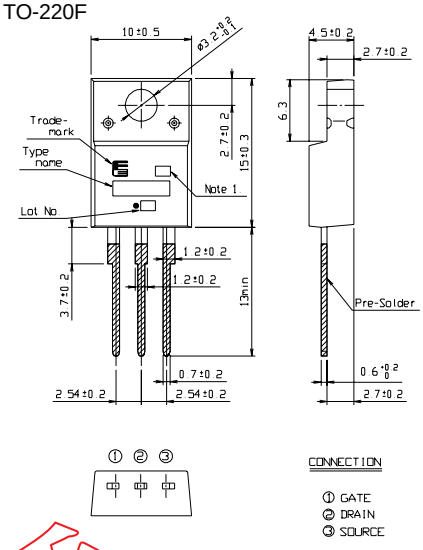
- High speed switching
- Low on-resistance
- No secondary breakdown
- Low driving power
- High voltage
- Avalanche-proof

■ Applications

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

■ Outline Drawings

TO-220F



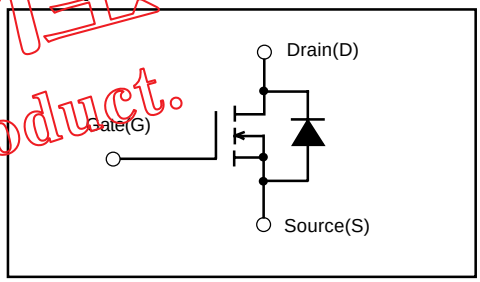
■ Maximum ratings and characteristics

● **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	±50	A	
Pulsed drain current	$I_{D(puls)}$	±200	A	
Gate-source peak voltage	V_{GS}	±16	V	
Maximum avalanche energy	E_{AV}	520	mJ	*1
Maximum power dissipation	P_D	40	W	
Operating and storage temperature range	T_{ch}	+150	°C	
	T_{stg}	-55 to +150	°C	

*1 L=0.277mH, Vcc=12V

■ Equivalent circuit schematic



● **Electrical characteristics (T_c =25°C unless otherwise specified)**

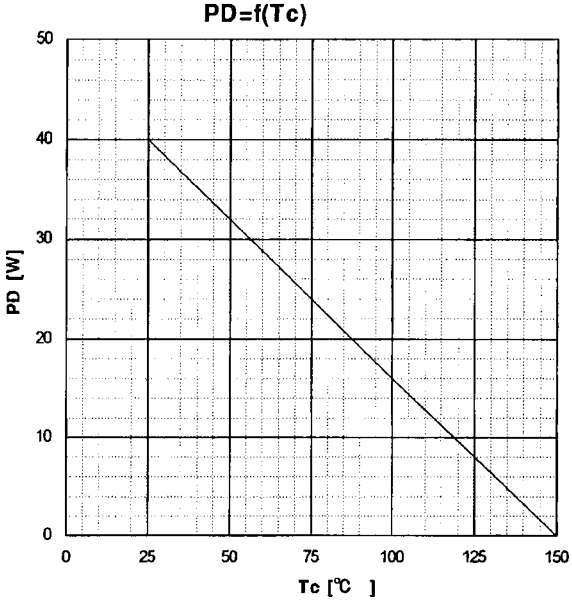
Item	Symbol	Test Conditions		Min.	Typ.	Max.	Units
Drain-source breakdown voltage	$V_{(BR)DSS}$	I_D=1mA V_{GS}=0V		30			V
Gate threshold voltage	$V_{GS(th)}$	I_D=1mA V_{DS}=V_{GS}		1.0	1.5	2.0	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=30V V_{GS}=0V	T_{ch}=25°C		10	500	μA
			T_{ch}=125°C		0.2	1.0	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=25A V_{GS}=10V	V_{GS}=4V		12	17	mΩ
			V_{GS}=10V		7.5	10	mΩ
Forward transconductance	g_{fs}	I_D=25A V_{DS}=25V		22	45		S
Input capacitance	C_{iss}	V_{DS}=25V			2750	4130	pF
Output capacitance	C_{oss}	V_{GS}=0V			1300	1950	
Reverse transfer capacitance	C_{rss}	f=1MHz			600	900	
Turn-on time	$t_{d(on)}$	V_{CC}=15V R_G=10 Ω			13	20	ns
	t_r	I_D=50A			55	83	
Turn-off time	$t_{d(off)}$	V_{GS}=10V			180	270	
	t_f				150	230	
Avalanche capability	I_{AV}	L=100μH T_{ch}=25°C		50			A
Diode forward on-voltage	V_{SD}	I_F=2xI_{DR} V_{GS}=0V T_{ch}=25°C			1.14	1.71	V
Reverse recovery time	t_{rr}	I_F=2xI_{DR} V_{GS}=0V			85	130	ns
Reverse recovery charge	Q_{rr}	-di/dt=100A/μs T_{ch}=25°C			0.17		μC

● **Thermal characteristics**

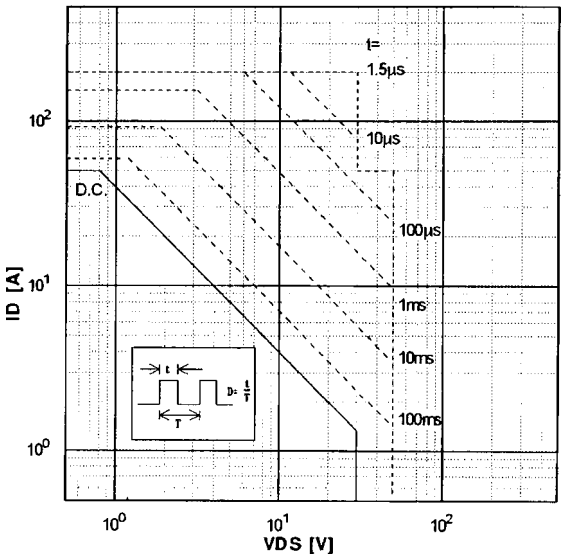
Item	Symbol	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-c)}$			3.125	°C/W
	$R_{th(ch-a)}$			62.5	°C/W

Characteristics

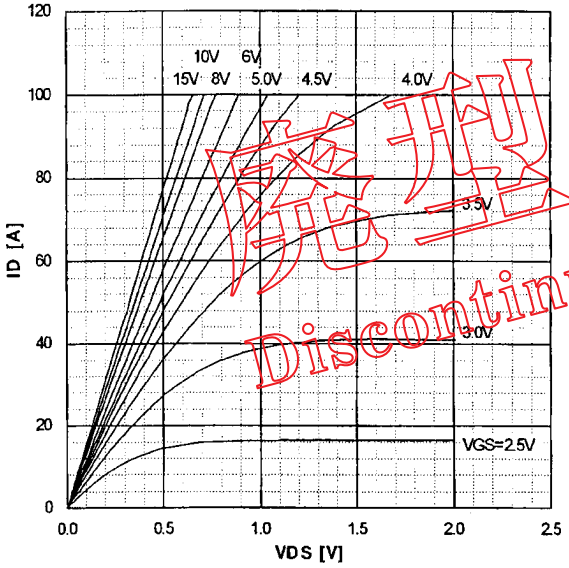
Power Dissipation
PD=f(Tc)



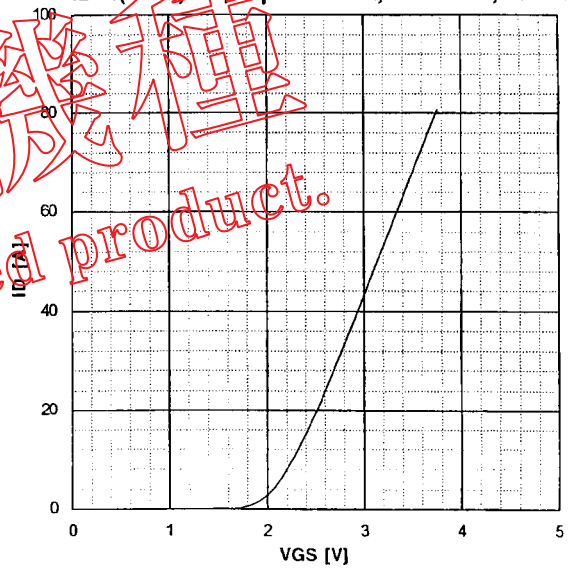
Safe operating area
ID=f(VDS):D=0.01,Tc=25℃



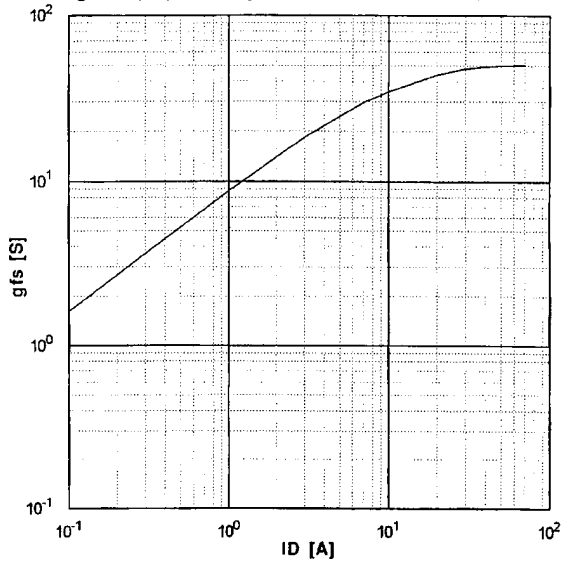
Typical Output Characteristics
ID=f(VDS):80µs pulse test,Tch=25℃



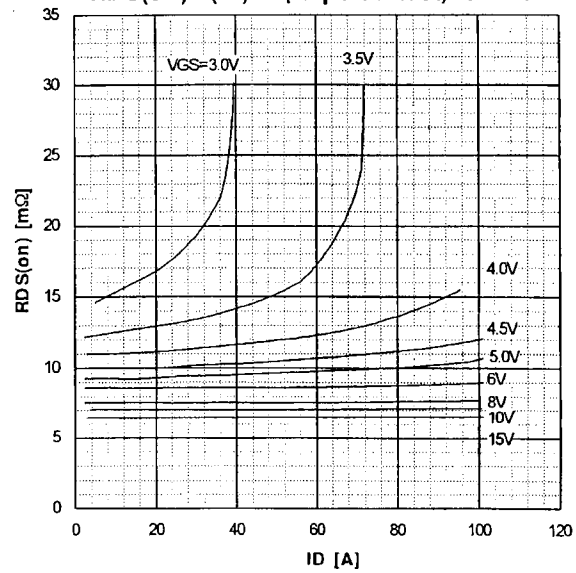
Typical Transfer Characteristic
ID=f(VGS):80µs pulse test,VDS=25V,Tch=25℃



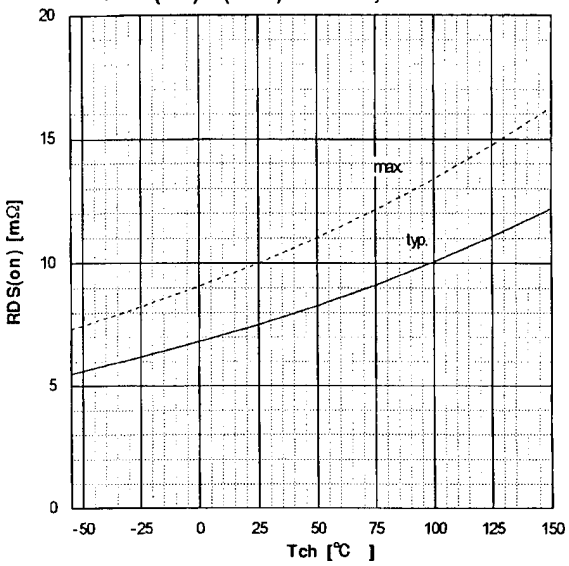
Typical Transconductance
gfs=f(ID):80µs pulse test,VDS=25V,Tch=25℃



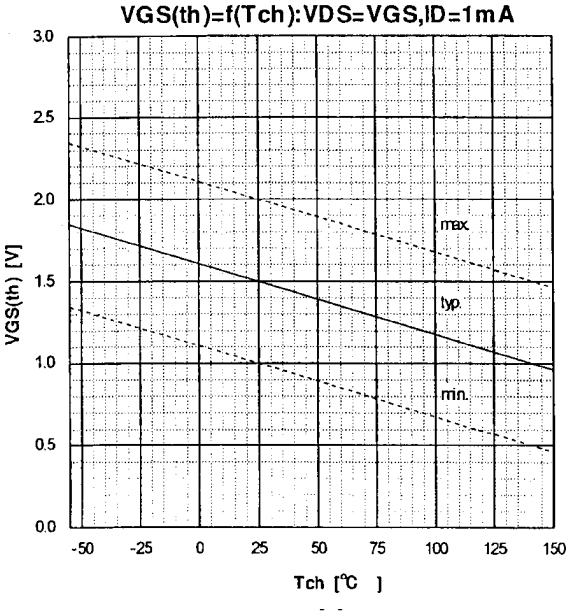
Typical Drain-Source on-state Resistance
RDS(on)=f(ID):80µs pulse test,Tch=25℃



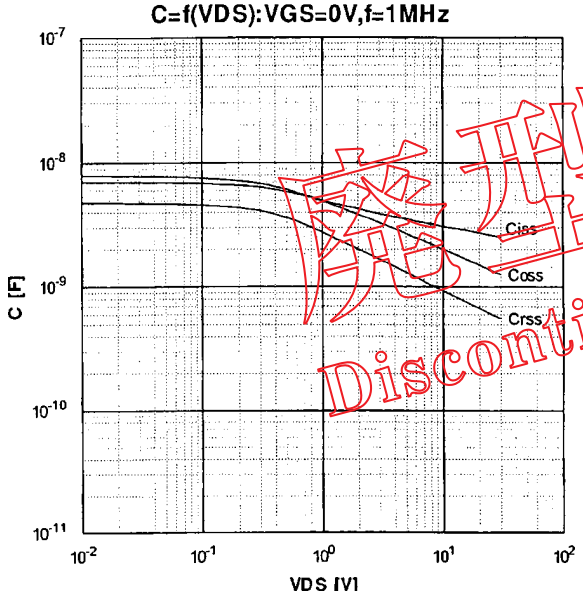
Drain-Source On-state Resistance
RDS(on)=f(Tch):ID=25A,VGS=10V



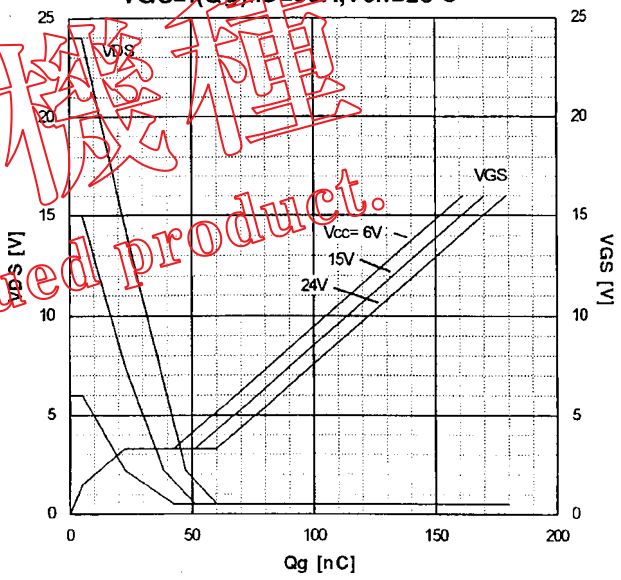
Gate Threshold Voltage
VGS(th)=f(Tch):VDS=VGS,ID=1mA



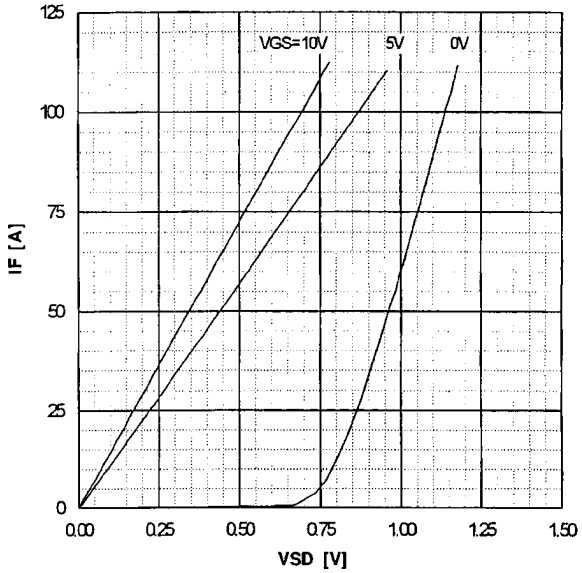
Typical Capacitance
C=f(VDS):VGS=0V,f=1MHz



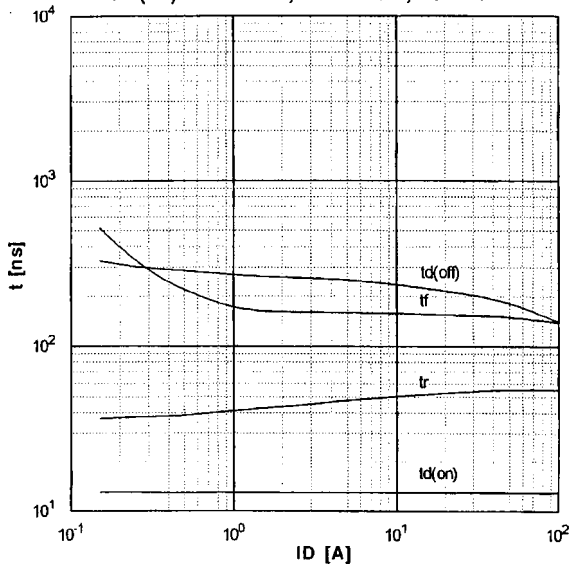
Typical Gate Charge Characteristics
VGS=f(Qg):ID=50A,Tch=25℃



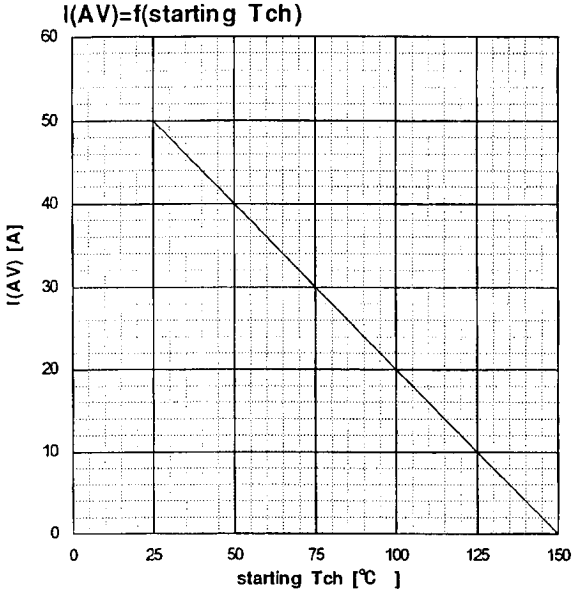
Typical Forward Characteristics of Reverse Diode
IF=f(VSD):80μs pulse test,Tch=25℃



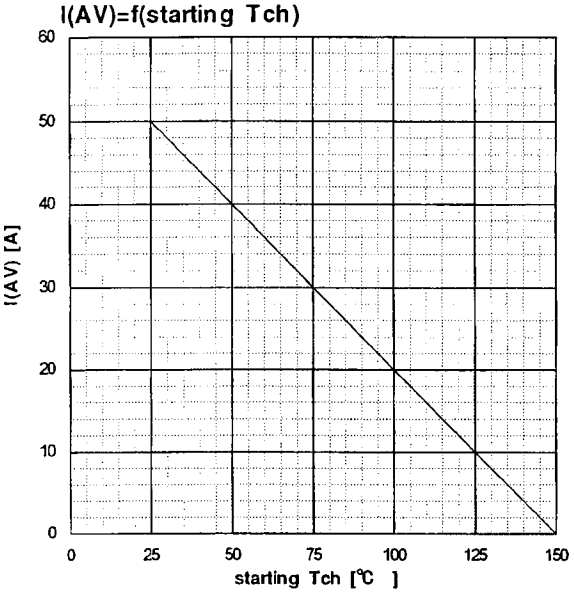
Typical Switching Characteristics vs. ID
t=f(ID):Vcc=15V,VGS=10V,RG=10Ω



Maximum Avalanche Current vs. starting Tch
I(AV)=f(starting Tch)



Maximum Avalanche Current vs. starting Tch
I(AV)=f(starting Tch)



Transient Thermal impedance
Zth(ch-c)=f(t) parameter:D=t/T