2SK3270-01

FUJI POWER MOSFET

Fuji Electric

200509

N-CHANNEL SILICON POWER MOSFET

Trench Power MOSFET

■ Features

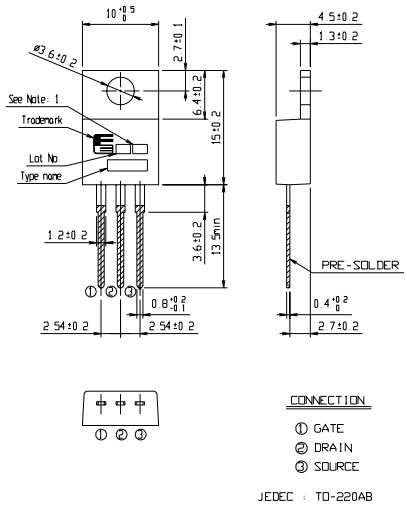
- High speed switching
- Low on-resistance
- No secondary breakdown
- Low driving power
- Avalanche-proof

■ Applications

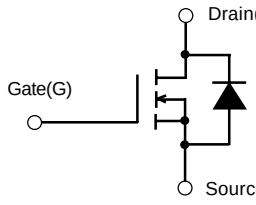
- Switching regulators
- DC-DC converters
- General purpose power amplifier

■ Outline Drawings

TO-220AB



■ Equivalent circuit schematic



■ Maximum ratings and characteristics

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

Item	Symbol	Rating	Unit	Remarks
Drain-source voltage	V_{DS}	60	V	
	V_{DSX}	30	V	V_{GS}=-20V
Continuous drain current	I_D	±80	A	
Pulsed drain current	$I_{D[puls]}$	±320	A	
Gate-source peak voltage	V_{GS}	+30/-20	V	
Maximum avalanche energy	E_{AV}	484.3	mJ	*1
Maximum power dissipation	P_D	135	W	
Operating and storage temperature range	T_{ch}	+150	℃	
	T_{stg}	-55 to +150	℃	

*1 L=101μH, Vcc=24V

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

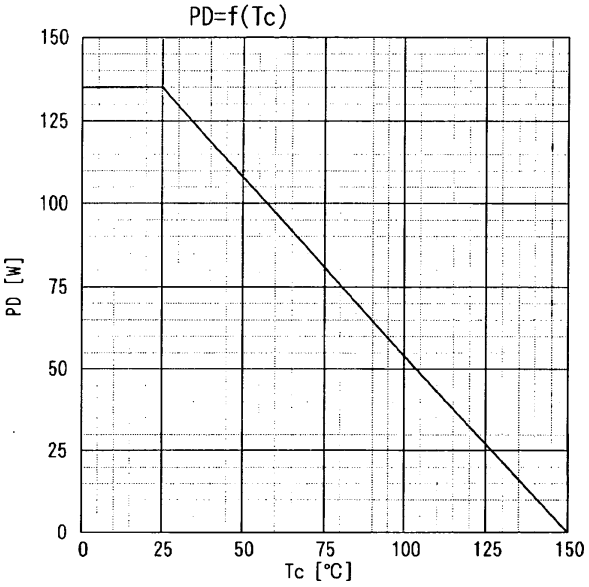
Item	Symbol	Test Conditions		Min.	Typ.	Max.	Units
Drain-source breakdown voltage	BV_{DSS}	I_D=1mA V_{GS}=0V		60			V
	BV_{DSX}	I_D=1mA V_{GS}=-20V		30			V
Gate threshold voltage	$V_{GS(th)}$	I_D=10mA V_{DS}=V_{GS}		2.5	3.0	3.5	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=60V V_{GS}=0V	T_{ch}=25°C		1.0	100	μA
			T_{ch}=125°C		10	500	μA
Gate-source leakage current	I_{GSS}	V_{GS}=+30V,-20V V_{DS}=0V			10	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	I_D=40A V_{GS}=10V			5.0	6.5	mΩ
Forward transconductance	g_{fs}	I_D=40A V_{DS}=10V		25	50		S
Input capacitance	C_{iss}	V_{DS}=25V			9000		pF
Output capacitance	C_{oss}	V_{GS}=0V			1250		pF
Reverse transfer capacitance	C_{rss}	f=1MHz			700		pF
Turn-on time	$t_{d(on)}$	V_{CC}=30V R_G=10 Ω			50		ns
	t_r	I_D=80A			200		ns
Turn-off time	$t_{d(off)}$	V_{GS}=10V			150		ns
	t_f				135		ns
Total gate charge	Qg	V_{CC}=30V			145		nC
Gate-Source charge	Qgs	I_D=80A			60		nC
Gate-Drain charge	Qgd	V_{GS}=10V			40		nC
Avalanche capability	I_{AV}	L=100μH T_{ch}=25°C		80			A
Diode forward on-voltage	V_{SD}	I_F=80A V_{GS}=0V T_{ch}=25°C			1.0	1.5	V
Reverse recovery time	t_{rr}	I_F=50A V_{GS}=0V			85		ns
Reverse recovery charge	Qrr	-di/dt=100A/μs T_{ch}=25°C			0.25		μC

● Thermal characteristics

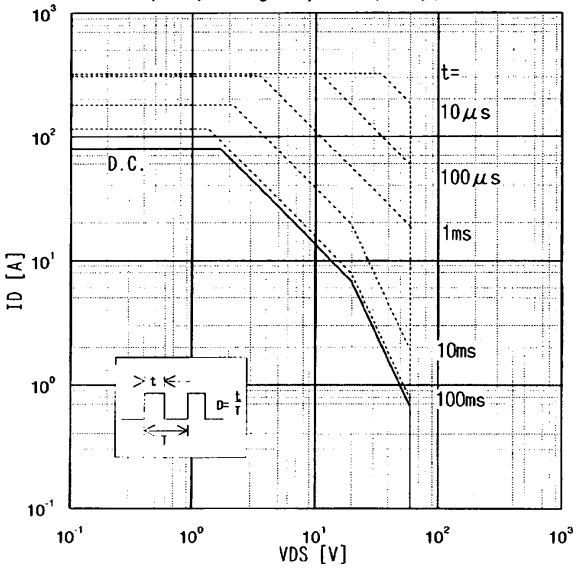
Item	Symbol	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-c)}$			0.926	°C/W
	$R_{th(ch-a)}$			75.0	°C/W

Characteristics

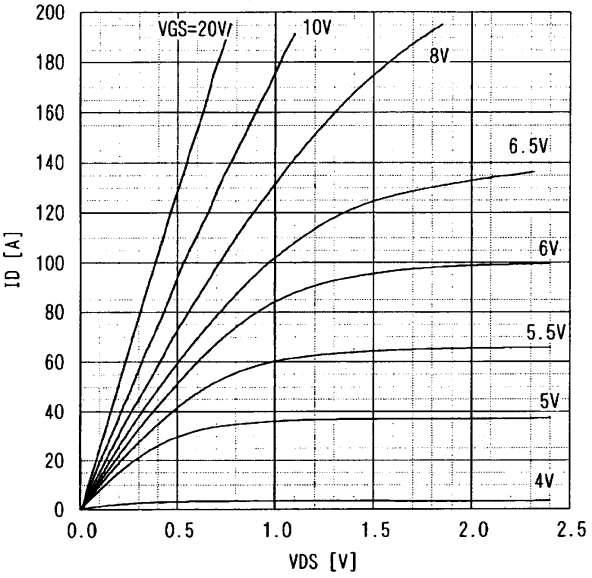
Power Dissipation
PD=f(Tc)



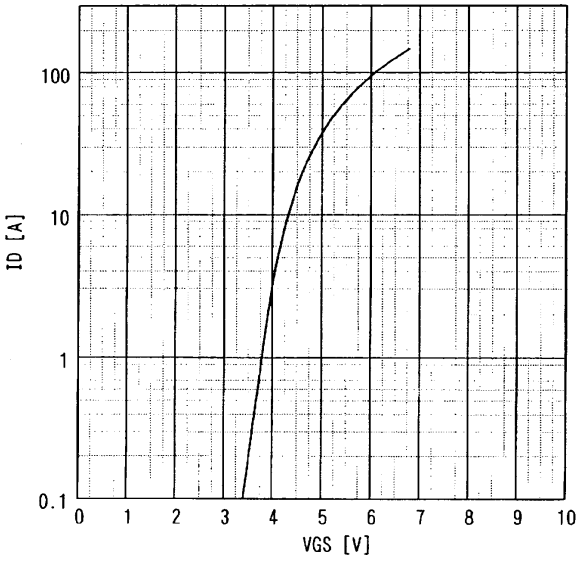
Safe operating area
ID=f(VDS):Single pulse(D=0),Tc=25°C



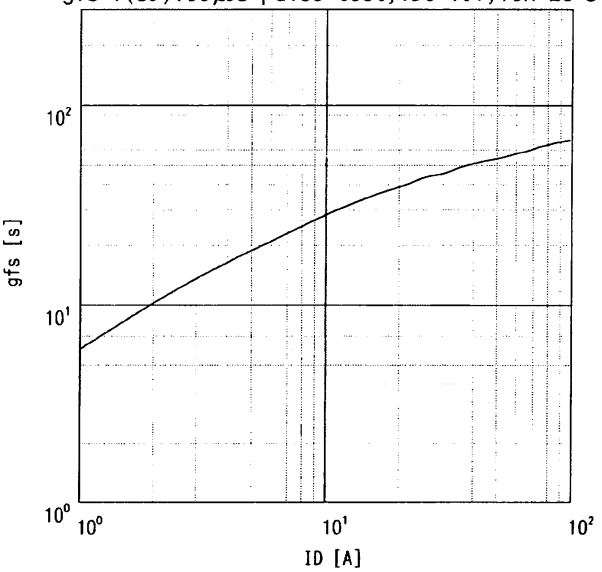
Typical output characteristics
ID=f(VDS):80μs pulse test,Tc=25°C



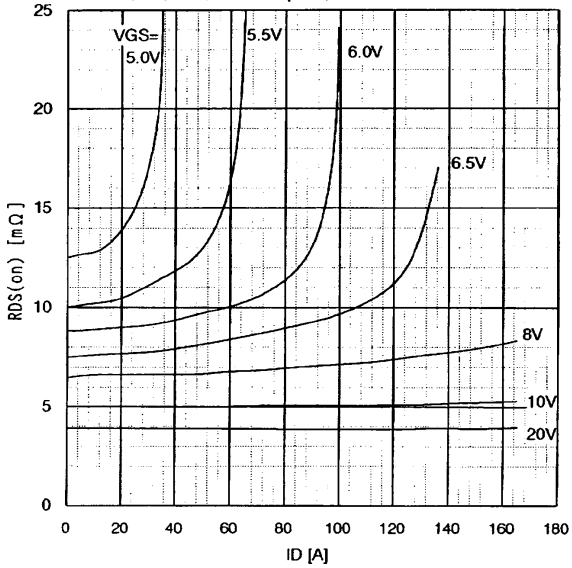
Typical transfer characteristics
ID=f(VGS):80μs pulse test,VDS=10V,Tch=25°C



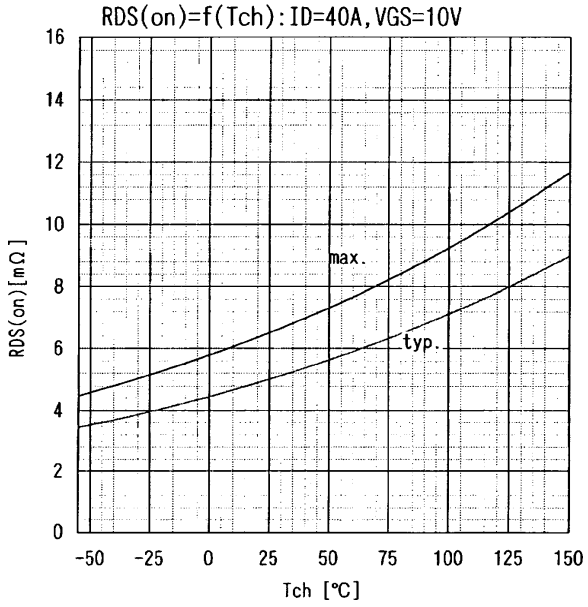
Typical forward transconductance
gfs=f(ID):80μs pulse test,VDS=10V,Tch=25°C



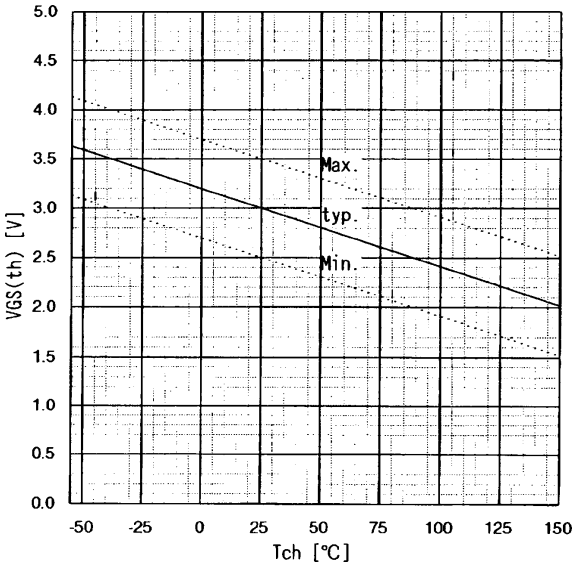
Typical Drain-Source on-State Resistance
RDS(on)=f(ID):80μs pulse test,Tch=25°C



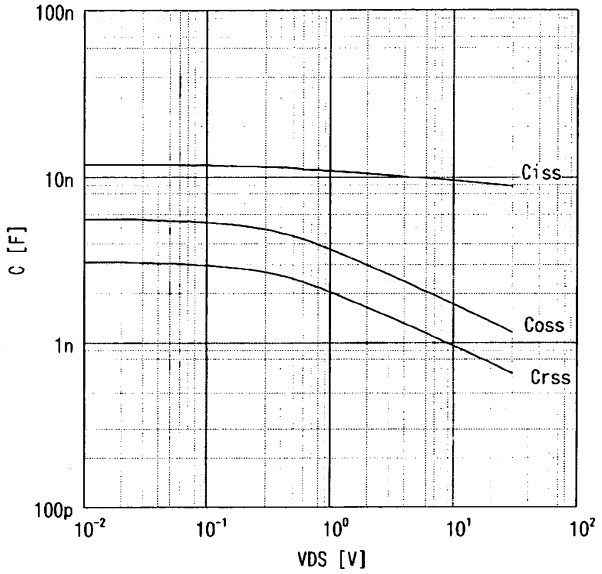
Drain-source on-state resistance
RDS(on)=f(Tch):ID=40A,VGS=10V



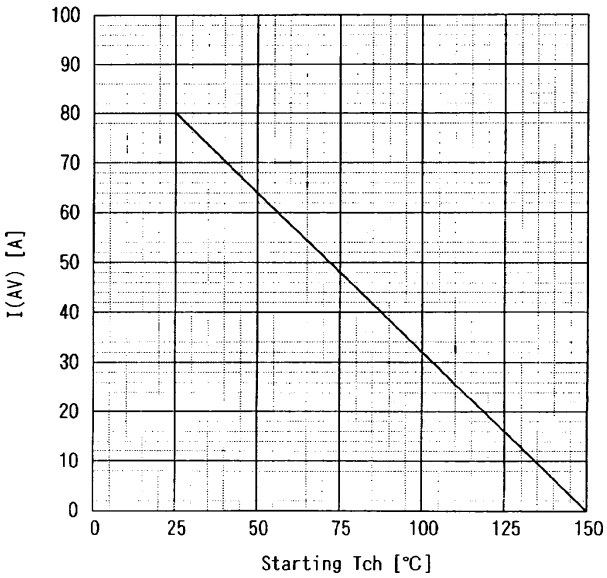
Gate Threshold Voltage vs. Tch
VGS(th)=f(Tch):VDS=VGS,ID=10mA



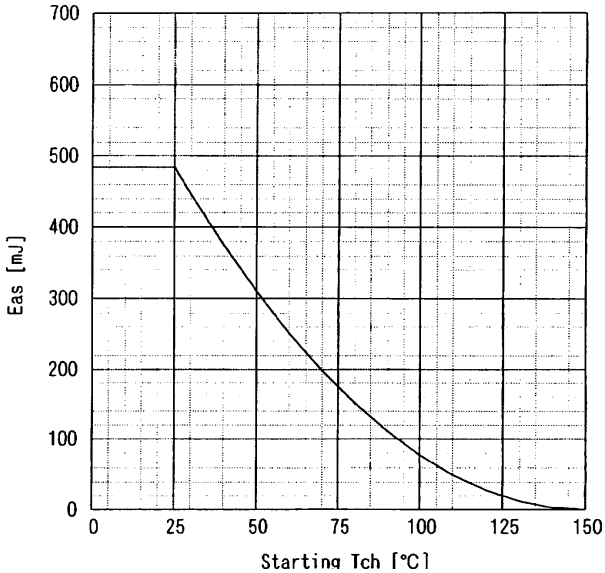
Typical capacitances
C=f(VDS):VGS=0V,f=1MHz



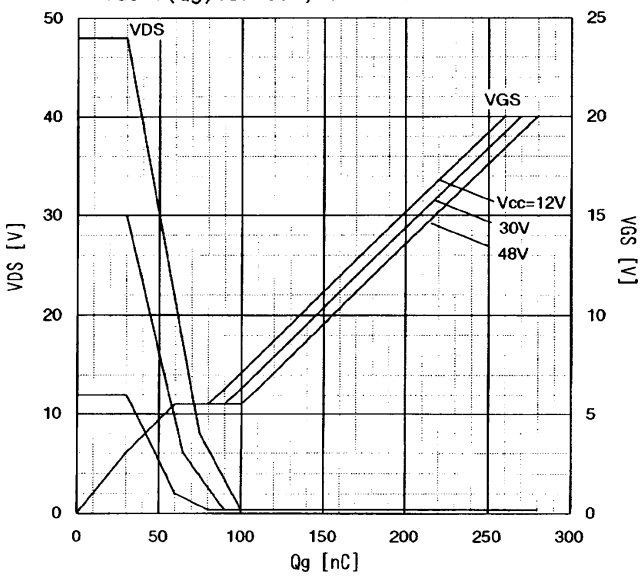
Maximum Avalanche Current vs. starting Tch
I(AV)=f(starting Tch) , single pulse



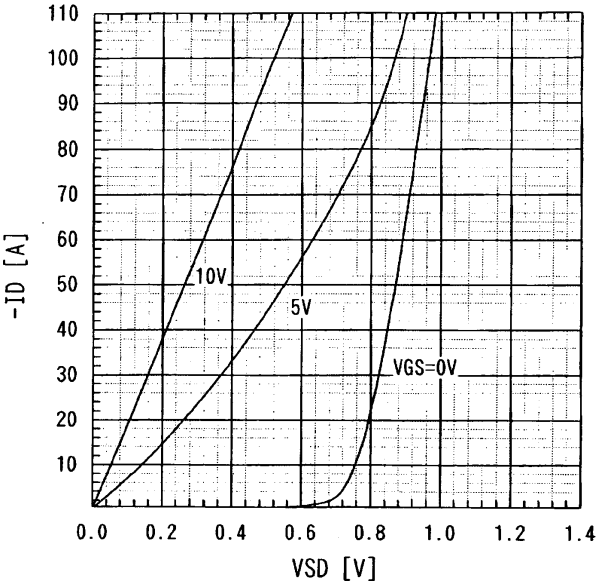
Maximum Avalanche energy vs. starting Tch
Eas=f(starting Tch):Vcc=24V,I_{AV}≦80A , single pulse



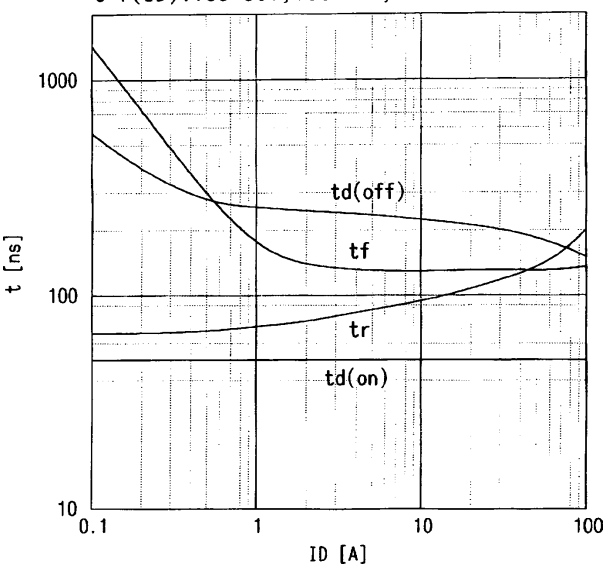
Typical Gate Charge Characteristics
VGS=f(Qg):ID=80A,Tch=25℃



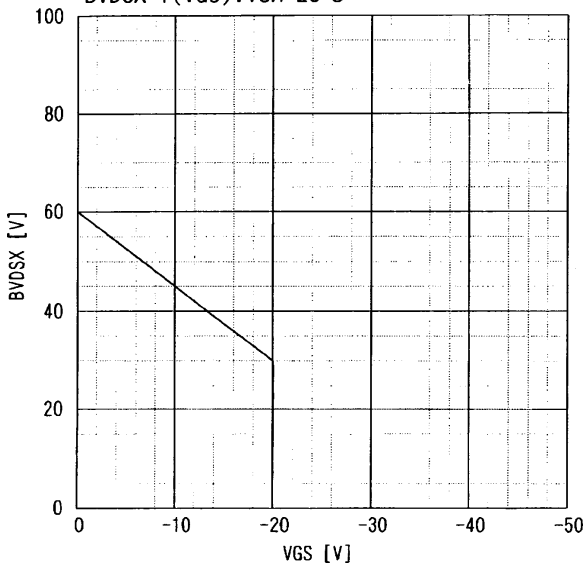
Typical Forward Characteristics of Reverse Diode
-ID=f(VSD):80μs pulse test,Tch=25℃



Typical Switching Characteristics vs. ID
t=f(ID):Vcc=30V,VGS=10V,RG=10Ω



Drain-Sourse Breakdown Voltage vs. Vgs
BVDSX=f(VGS):Tch=25℃



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