2SK2644-01 FUJI POWER MOSFET

FUJI ELECTRIC
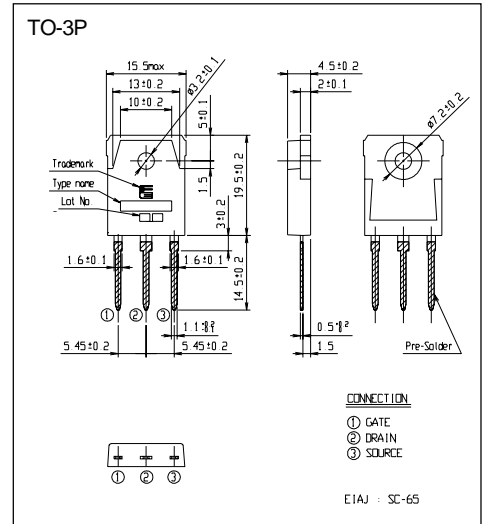
N-CHANNEL SILICON POWER MOSFET

FAP-IIS SERIES

■ Features
- **High speed switching**
- **Low on-resistance**
- **No secondary breakdown**
- **Low driving power**
- **High voltage**
- **$V_{GS}=\pm35V$ Guarantee**
- **Avalanche-proof**

■ Applications
- **Switching regulators**
- **UPS**
- **DC-DC converters**
- **General purpose power amplifier**

■ Outline Drawings

TO-3P

CONNECTION
① GATE
② DRAIN
③ SOURCE

EIAJ : SC-65

■ Maximum ratings and characteristics

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

Item	Symbol	Rating	Unit	Remarks
Drain-source voltage	V_{DS}	500	V	
Continuous drain current	I_D	±18	A	
Pulsed drain current	$I_{D[puls]}$	±72	A	
Gate-source peak voltage	V_{GS}	±35	V	
Repetitive or non-repetitive	I_{AV}	18	A	$R_{ch}\leqq150°C$
Maximum avalanche energy	E_{AV}	518.5	mJ	
Maximum power dissipation	P_D	125	W	
Operating and storage	T_{ch}	+150	°C	
temperature range	T_{stg}	-55 to +150	°C	

■ Equivalent circuit schematic
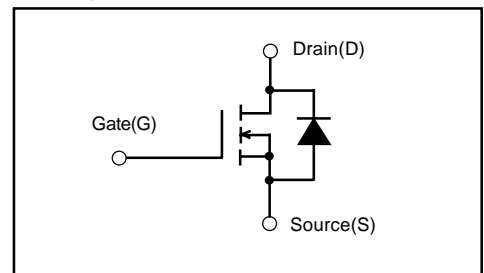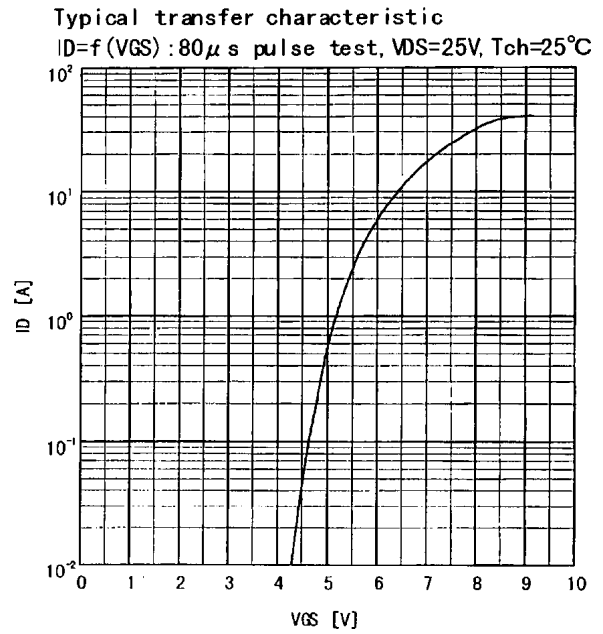

● Electrical characteristics (Tc =25°C unless otherwise specified)

Item	Symbol	Test Conditions		Min.	Typ.	Max.	Units
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D=1mA$ $V_{GS}=0V$		500			V
Gate threshold voltage	$V_{GS(th)}$	$I_D=1mA$ $V_{DS}=V_{GS}$		3.5	4.0	4.5	V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=500V$ $V_{GS}=0V$	$T_{ch}=25°C$		10	500	μA
			$T_{ch}=125°C$		0.2	1.0	mA
Gate-source leakage current	I_{GSS}	$V_{GS}=\pm35V$ $V_{DS}=0V$			10	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$I_D=9A$ $V_{GS}=10V$			0.38	0.45	Ω
Forward transconductance	g_{fs}	$I_D=9A$ $V_{DS}=25V$		5.5	11		S
Input capacitance	C_{iss}	$V_{DS}=25V$			1700	2600	pF
Output capacitance	C_{oss}	$V_{GS}=0V$			280	420	
Reverse transfer capacitance	C_{rss}	$f=1MHz$			120	180	
Turn-on time	$t_{d(on)}$	$V_{CC}=300V$ $R_G=10\Omega$			20	30	ns
	t_r	$I_D=18A$			100	150	
Turn-off time	$t_{d(off)}$	$V_{GS}=10V$			110	165	
	t_f				65	100	
Avalanche capability	I_{AV}	$L=2.93mH$ $T_{ch}=25°C$		18			A
Diode forward on-voltage	V_{SD}	$I_F=2\times I_{DR}$ $V_{GS}=0V$ $T_{ch}=25°C$			1.1	1.65	V
Reverse recovery time	t_{rr}	$I_F=I_{DR}$ $V_{GS}=0V$			620		ns
Reverse recovery charge	Q_{rr}	$-di/dt=100A/\mu s$ $T_{ch}=25°C$			9.0		μC

● Thermal characteristics

Item	Symbol		Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-c)}$				1.0	°C/W
	$R_{th(ch-a)}$				35.0	°C/W

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■ Characteristics

Power Dissipation
PD=f (Tc)

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

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

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

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

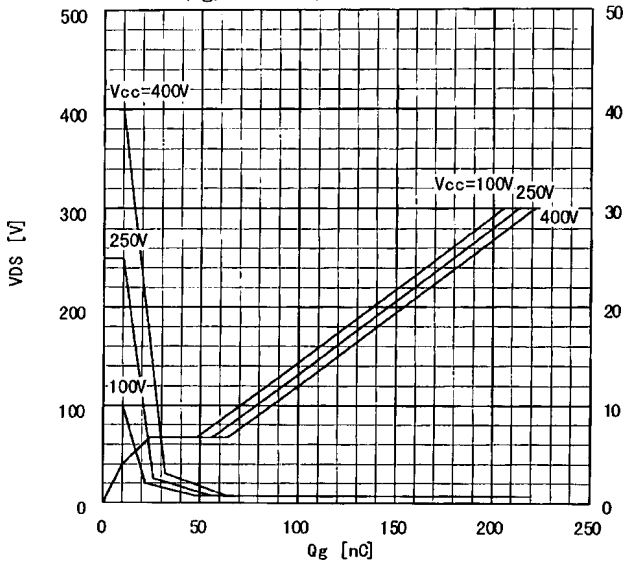Typical drain-source on-state resistance
RDS(on)=f (ID) : 80μs pulse test, Tc=25°C
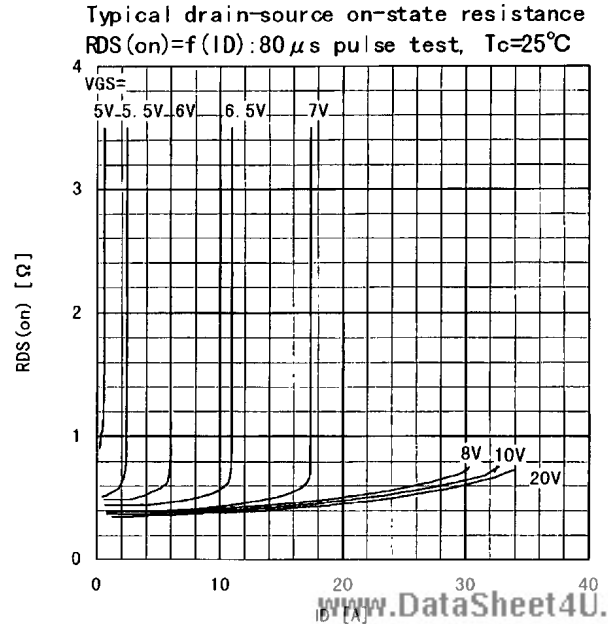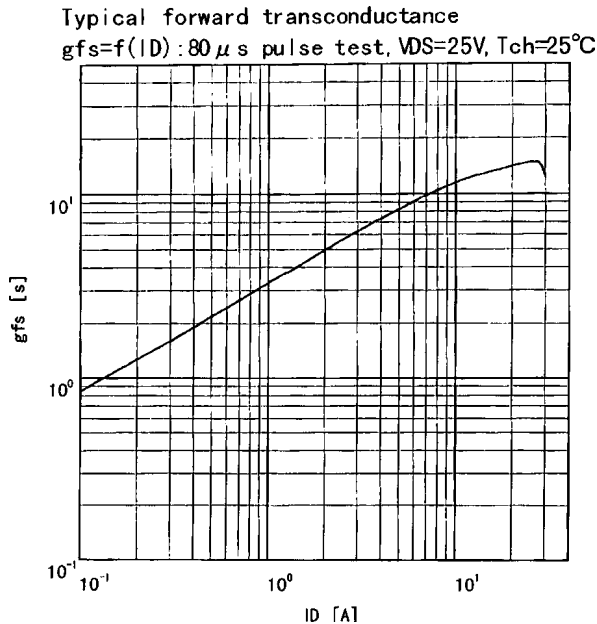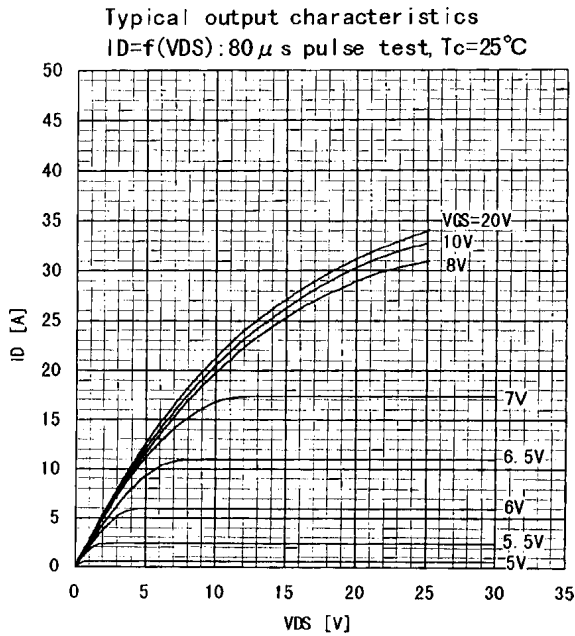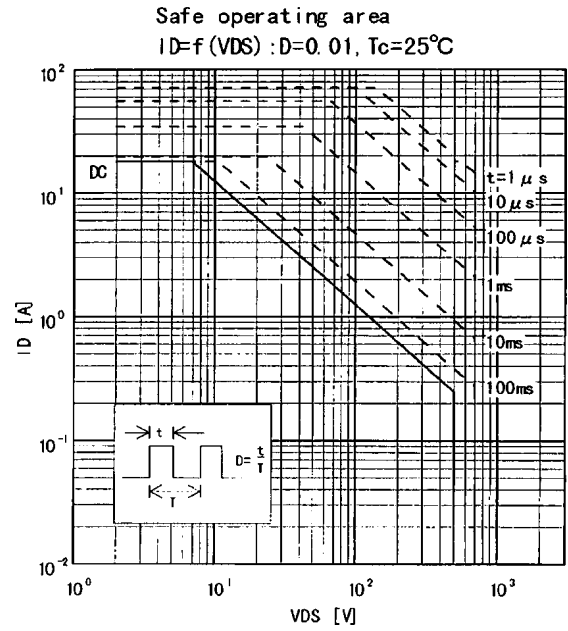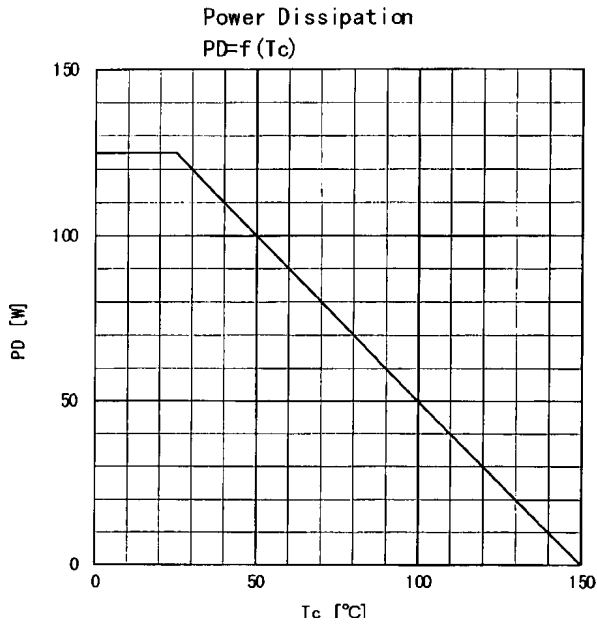
Drain-source on-state resistance
RDS(on)=f(Tch) : ID=9A, VGS=10V
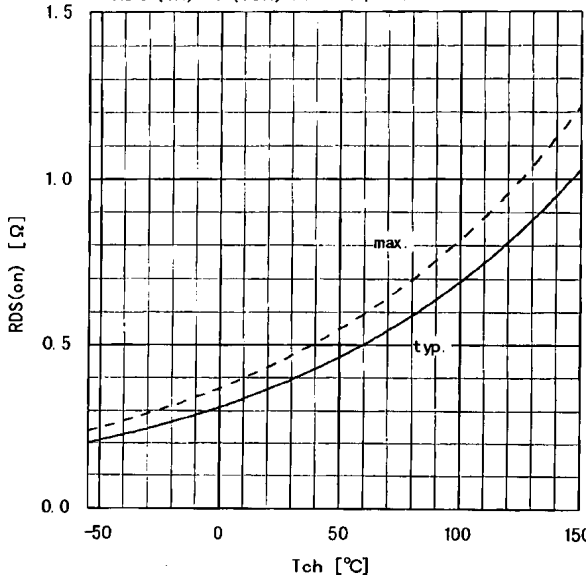
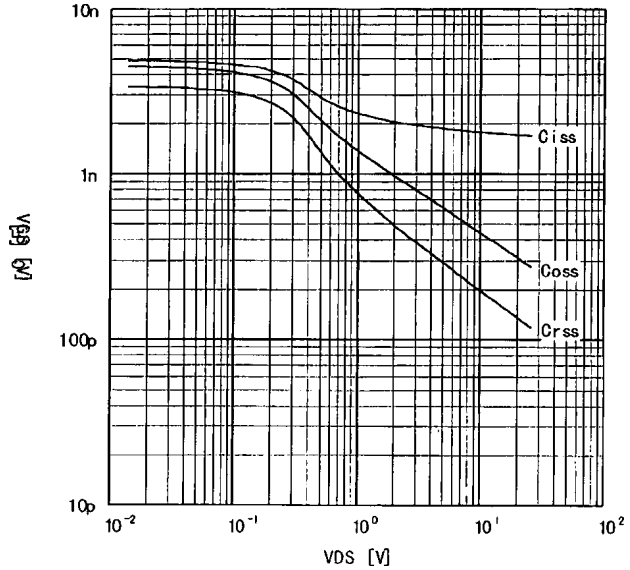### Gate threshold voltage
VGS(th)=f(Tch) : ID=1mA, VDS=VGS
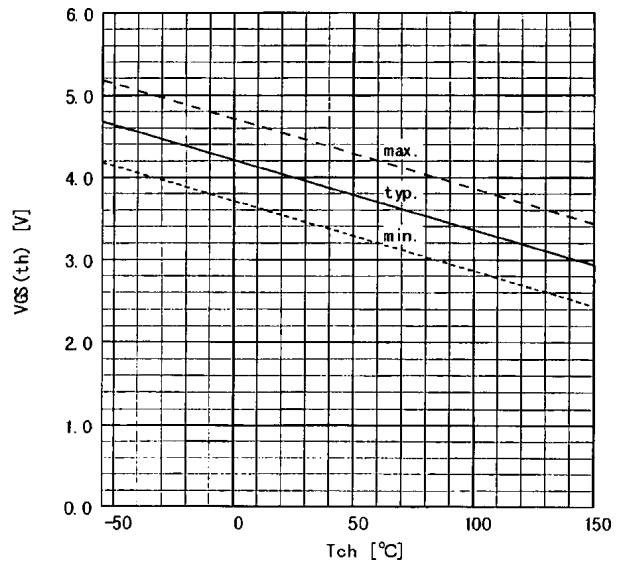
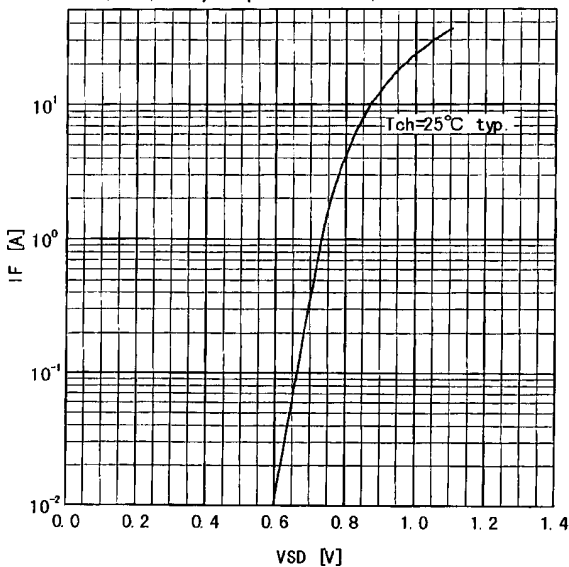### Typical gate charge characteristic
VGS=f(Qg) : ID=18A, Tc=25°C

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

Forward characteristic of reverse of diode
IF=f(VSD) : 80μs pules test, VGS=0V

Avalanche energy derating
Eas=f(starting Tch) : Vcc=50V, I_{AV}=18A

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Transient thermal impedance
Zthch=f(t) parameter:D=t/T