2SK1088-MR

FUJI POWER MOSFET

N-CHANNEL SILICON POWER MOSFET

F-Ⅲ SERIES

■ Features
- ● **High current**
- ● **Low on-resistance**
- ● **No secondary breakdown**
- ● **Low driving power**
- ● **High forward transconductance**

■ Applications
- ● **Motor controllers**
- ● **General purpose power amplifier**
- ● **DC-DC converters**

■ Outline Drawings

TO-220F15

1. Gate
2. Drain
3. **Source**

JEDEC	——
EIAJ	SC-67

■ Maximum ratings and characteristics

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

Item	Symbol	Rating	Unit
Drain-source voltage	V_{DS}	150	V
Continuous drain current	I_D	9	A
Pulsed drain current	$I_{D(puls]}$	36	A
Continuous reverse drain current	I_{DR}	9	A
Gate-source peak voltage	V_{GS}	±20	V
Max. power dissipation	P_D	35	W
Operating and storage temperature range	T_{ch}	+150	°C
	T_{stg}	-55 to +150	°C

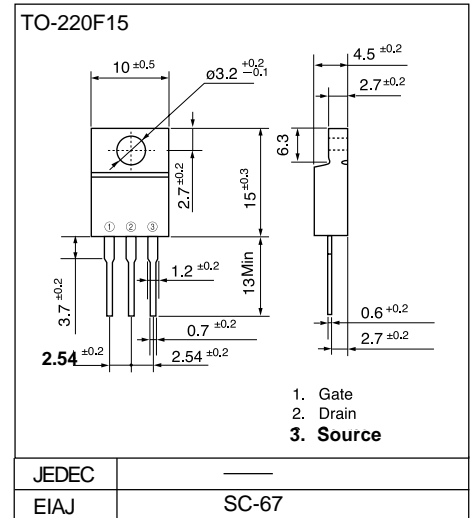### ■ Equivalent circuit schematic

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

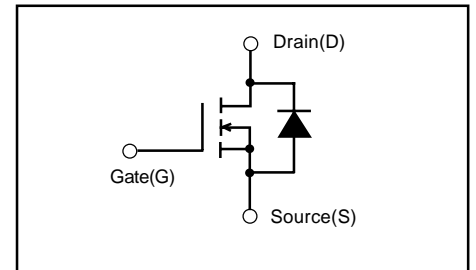| Item	Symbol	Test Conditions		Min.	Typ.	Max.	Units
Drain-source breakdown voltage	$V_{(BR)DSS}$	I_D=1mA V_{GS}=0V		150			V
Gate threshold voltage	$V_{GS(th)}$	I_D=1mA V_{DS}=V_{GS}		1.0	1.5	2.5	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=150V V_{GS}=0V	T_{ch}=25°C		10	500	µA
			T_{ch}=125°C		0.2	1.0	mA
Gate-source leakage current	I_{GSS}	V_{GS}=±20V V_{DS}=0V			10	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	I_D=4.5A V_{GS}=4V			0.26	0.40	Ω
		I_D=4.5A V_{GS}=10V			0.20	0.30	
Forward transconductance	g_{fs}	I_D=4.5A V_{DS}=25V		5.0	10.0		S
Input capacitance	C_{iss}	V_{DS}=25V			900	1200	pF
Output capacitance	C_{oss}	V_{GS}=0V			150	230	
Reverse transfer capacitance	C_{rss}	f=1MHz			40	60	
Turn-on time t_{on}	$t_{d(on)}$	V_{CC}=30V R_G=25 Ω			10	15	ns
(t_{on}=$t_{d(on)}$+t_r)	t_r	I_D=9A			40	60	
Turn-off time t_{off}	$t_{d(off)}$	V_{GS}=10V			150	230	
(t_{off}=$t_{d(off)}$+t_f)	t_f				30	45	
Diode forward on-voltage	V_{SD}	I_F=2xI_{DR} V_{GS}=0V T_{ch}=25°C			1.10	1.5	V
Reverse recovery time	t_{rr}	I_F=I_{DR} di/dt=100A/µs T_{ch}=25°C			100		ns

● Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-a)}$	channel to ambient			62.5	°C/W
	$R_{th(ch-c)}$	channel to case			3.57	°C/W

■ Characteristics
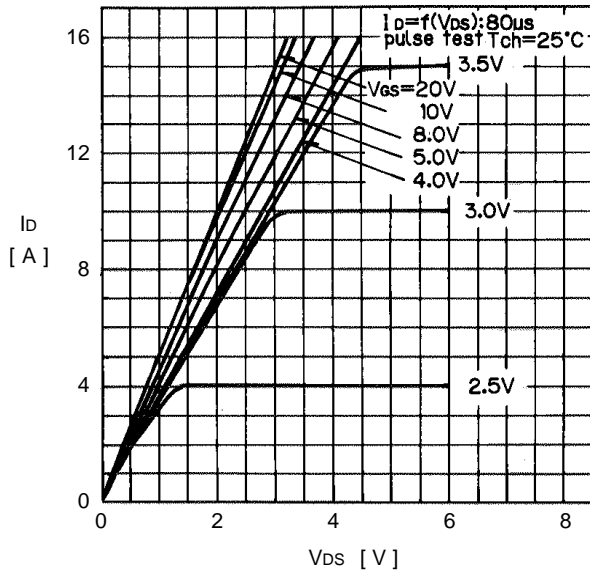
Typical output characteristics

$I_D = f(V_{DS})$: 80μs pulse test Tch=25°C

3.5V
VGS=20V
10V
8.0V
5.0V
4.0V
3.0V
2.5V

I_D [A] vs V_{DS} [V]

On state resistance vs. Tch

$R_{DS(on)} = f(T_{ch})$: I_D=4.5A, VGS=10V

max.
typ.

$R_{DS(on)}$ [Ω] vs T_{ch} [°C]
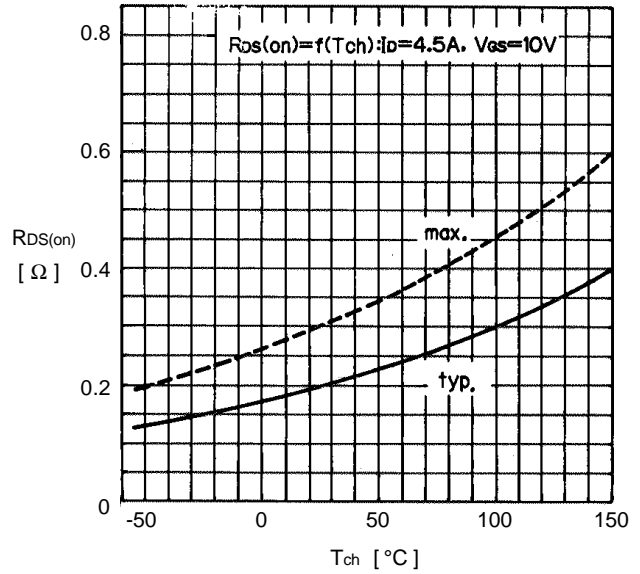
Typical transfer characteristics

$I_D = f(V_{GS})$: 80μs pulse test
VDS=25V, Tch=25°C

I_D [A] vs V_{GS} [V]
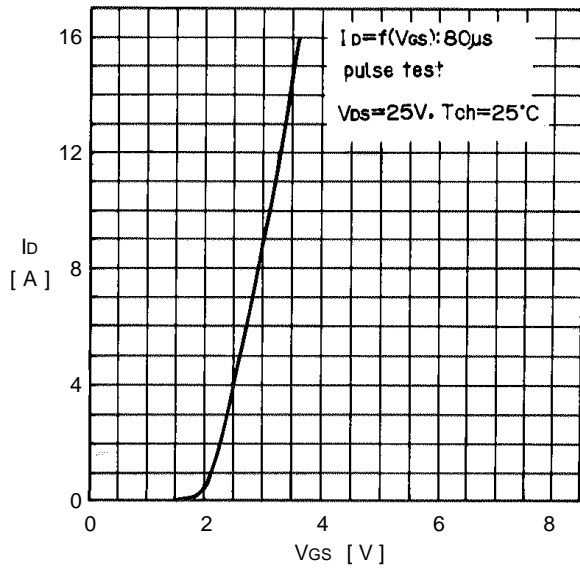
Typical Drain-Source on state resistance vs. ID

$R_{DS(on)} = f(I_D)$: Tch=25°C

VGS=2.5V   3.0V

3.5V
4.0V
5.0V
8.0V
10V
20V

$R_{DS(on)}$ [Ω] vs I_D [A]
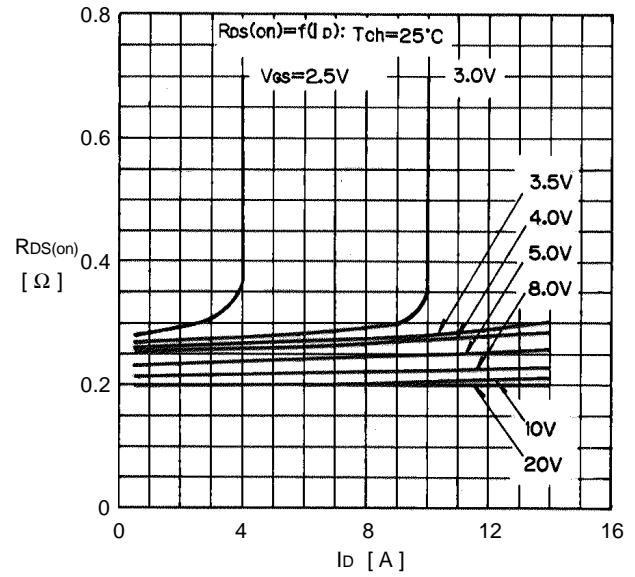
Typical forward transconductance vs. ID

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

gfs [S] vs I_D [A]

Gate threshold voltage vs. Tch

$V_{GS(th)} = f(T_{ch})$: I_D=1mA, VDS=VGS

max.
typ.
min.

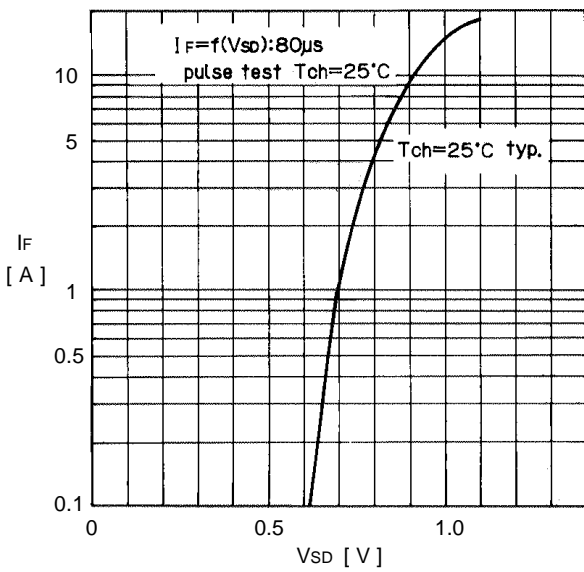$V_{GS(th)}$ [V] vs T_{ch} [°C]
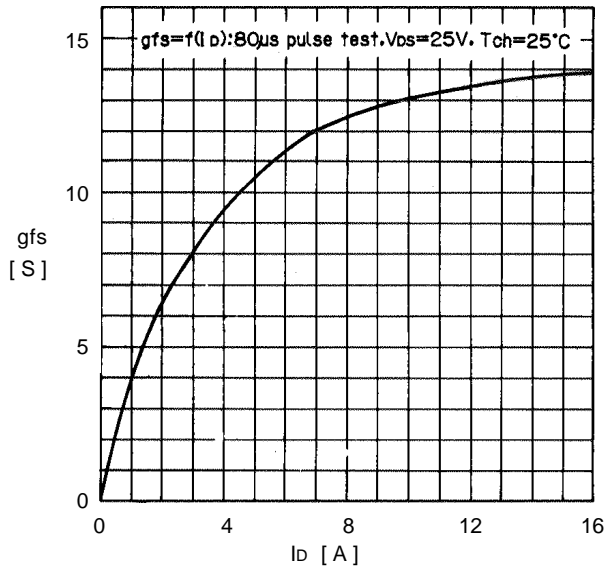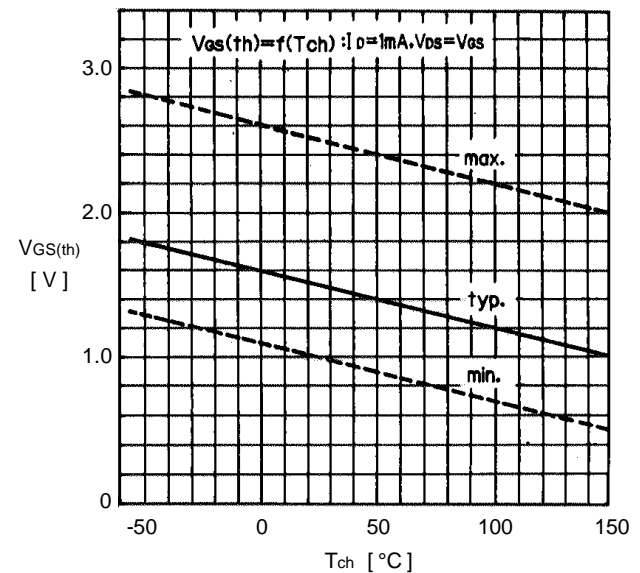
Typical capacitance vs. V_{DS}
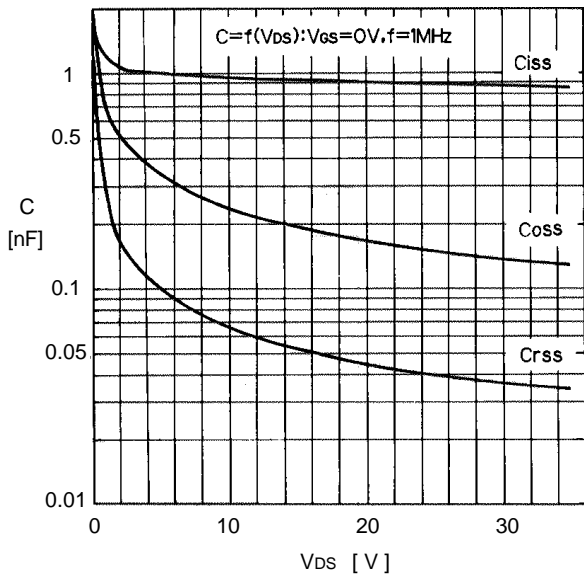
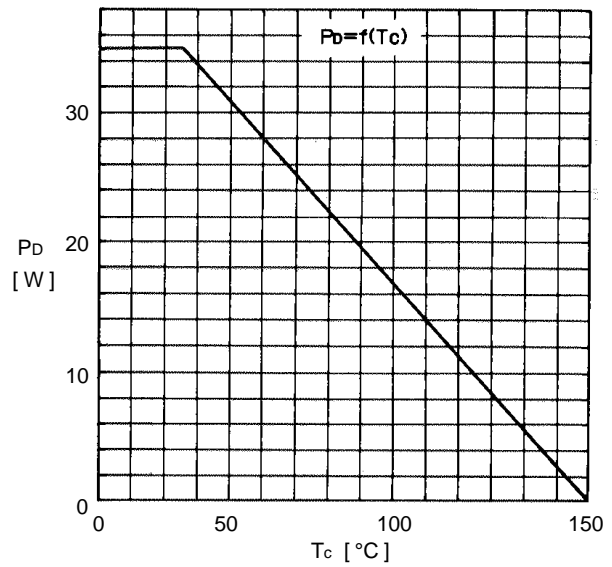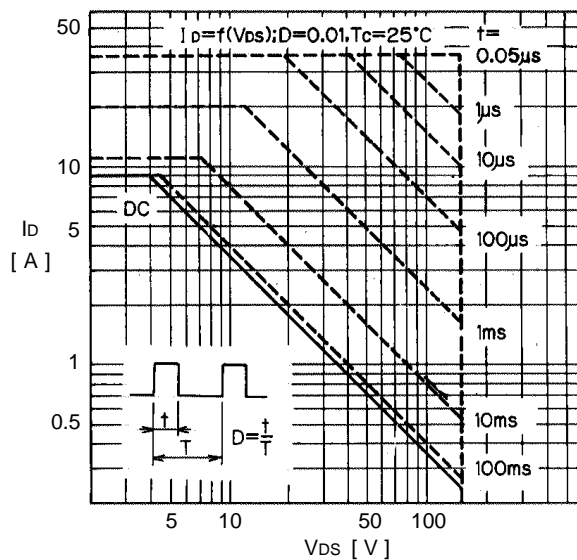## Typical input charge
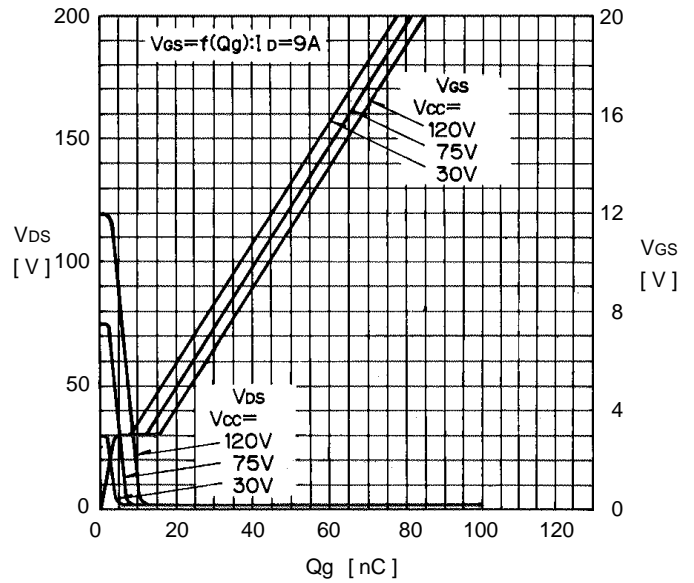
Forward characteristics of reverse diode

Allowable power dissipation vs. T_C

Transient thermal impedance

Safe operating area