FUJI ELECTRIC

2SK2809-01MR

FAP-IIIB Series

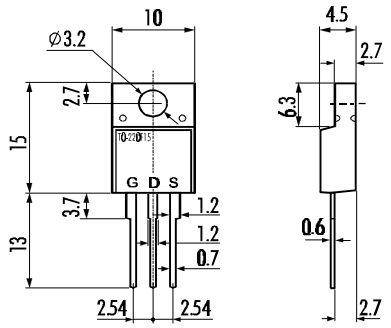
N-channel MOS-FET			
60V	0,01Ω	50A	50W

> Features

- High Current
- Low On-Resistance
- No Secondary Breakdown
- Low Driving Power
- Avalanche Rated

> Outline Drawing

TO-220F15



> Applications

- Motor Control
- General Purpose Power Amplifier
- DC-DC converters

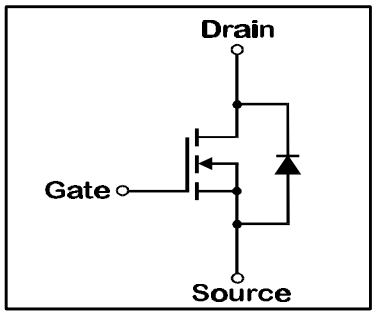
> Maximum Ratings and Characteristics

- Absolute Maximum Ratings (T_C=25°C), unless otherwise specified

Item	Symbol	Rating	Unit
Drain-Source-Voltage	V_{DS}	60	V
Continous Drain Current	I_D	50	A
Pulsed Drain Current	$I_{D(puls)}$	200	A
Gate-Source-Voltage	V_{GS}	±20	V
Maximum Avalanche Energy	E_{AV}	453	mJ*
Max. Power Dissipation	P_D	50	W
Operating and Storage Temperature Range	T_{ch}	150	°C
	T_{stg}	-55 ~ +150	°C

* L=0,241mH, V_{CC}=24V

> Equivalent Circuit



- Electrical Characteristics (T_C=25°C), unless otherwise specified

Item	Symbol	Test conditions		Min.	Typ.	Max.	Unit
Drain-Source Breakdown-Voltage	$V_{(BR)DSS}$	I_D=1mA	V_{GS}=0V	60			V
Gate Threshhold 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}=60V	T_{ch}=25°C		10	500	µA
		V_{GS}=0V	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=40A	V_{GS}=4V		0,012	0,017	Ω
			V_{GS}=10V		0,0075	0,01	Ω
Forward Transconductance	g_{fs}	I_D=40A	V_{DS}=25V	25	55		S
Input Capacitance	C_{iss}	V_{DS}=25V			3500	5250	pF
Output Capacitance	C_{oss}	V_{GS}=0V			1250	1870	pF
Reverse Transfer Capacitance	C_{rss}	f=1MHz			360	540	pF
Turn-On-Time t_{on} (t_{on}=$t_{d(on)}$+t_r)	$t_{d(on)}$	V_{CC}=30V			15	23	ns
	t_r	I_D=75A			75	120	ns
Turn-Off-Time t_{off} (t_{on}=$t_{d(off)}$+t_f)	$t_{d(off)}$	V_{GS}=10V			190	285	ns
	t_f	R_{GS}=10 Ω			110	165	ns
Avalanche Capability	I_{AV}	L = 100µH	T_{ch}=25°C	50			A
Diode Forward On-Voltage	V_{SD}	I_F=160A V_{GS}=0V	T_{ch}=25°C		1,15	1,65	V
Reverse Recovery Time	t_{rr}	I_F=80A V_{GS}=0V			75	120	ns
Reverse Recovery Charge	Q_{rr}	-dI_F/dt=100A/µs	T_{ch}=25°C		0,17		µC

- Thermal Characteristics

Item	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Thermal Resistance	$R_{th(ch-a)}$	channel to air			62,5	°C/W
	$R_{th(ch-c)}$	channel to case			2,50	°C/W

N-channel MOS-FET			
60V	0,01Ω	50A	50W

2SK2809-01MR

FAP-IIIB Series

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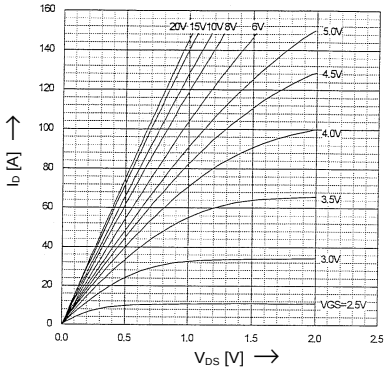
> Characteristics

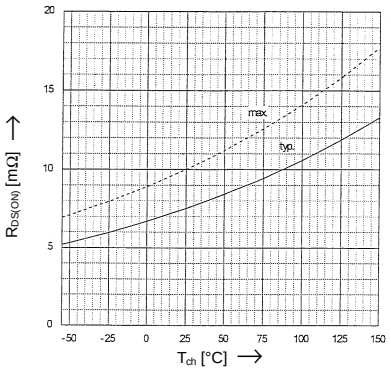
Typical Output Characteristics

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



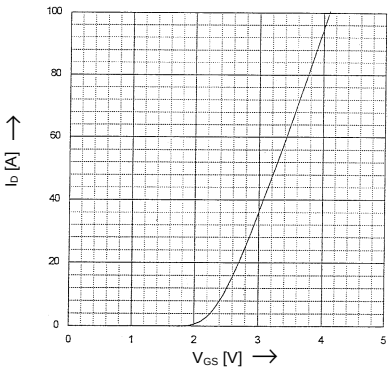
Drain-Source On-State Resistance vs. T_{ch}

$R_{DS(on)} = f(T_{ch})$; $I_D=40A$; $V_{GS}=10V$



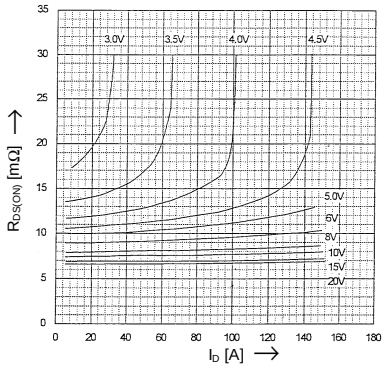
Typical Transfer Characteristics

$I_D=f(V_{GS})$; 80µs pulse test; $V_{DS}=25V$; $T_{ch}=25°C$



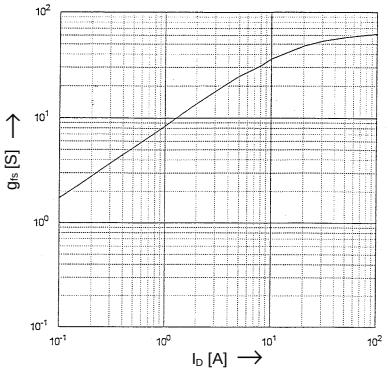
Typical Drain-Source On-State-Resistance vs. I_D

$R_{DS(on)}=f(I_D)$; 80µs pulse test; $T_C=25°C$



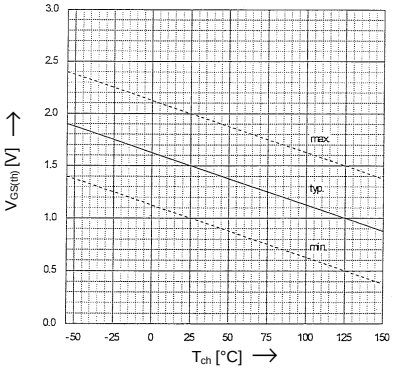
Typical Forward Transconductance vs. I_D

$g_{fs}=f(I_D)$; 80µs pulse test; $V_{DS}=25V$; $T_{ch}=25°C$



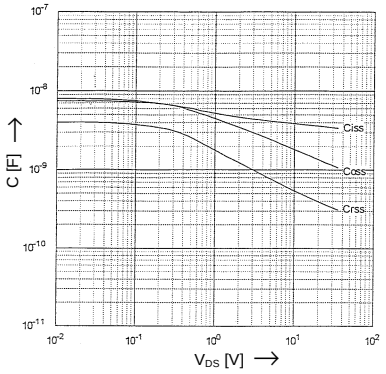
Gate Threshold Voltage vs. T_{ch}

$V_{GS(th)}=f(T_{ch})$; $I_D=1mA$; $V_{DS}=V_{GS}$



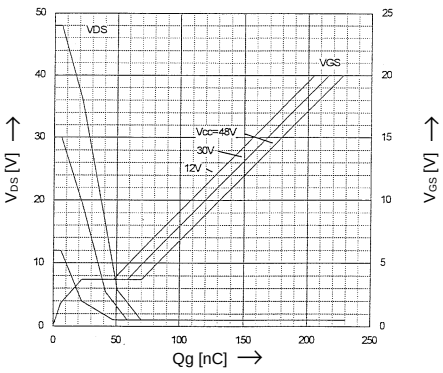
Typical Capacitances vs. V_{DS}

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



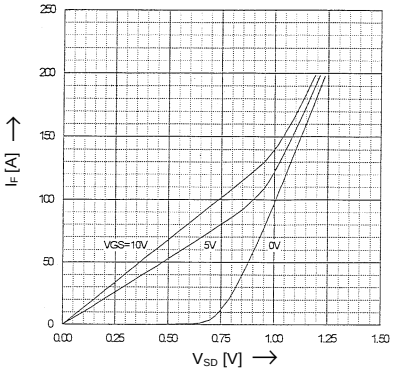
Typical Gate Charge Characteristic

$V_{GS}=f(Qg)$; $I_D=80A$; $T_C=25°C$



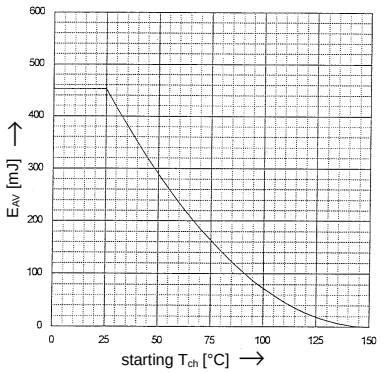
Forward Characteristics of Reverse Diode

$I_F=f(V_{SD})$; 80µs pulse test; $T_{ch}=25°C$



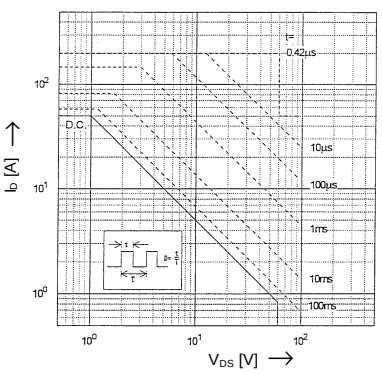
Maximum Avalanche Energy vs. starting T_{ch}

$E_{AV}=f(\text{starting } T_{ch})$: $V_{CC}=24V$; $I_{AV} \leq 50A$



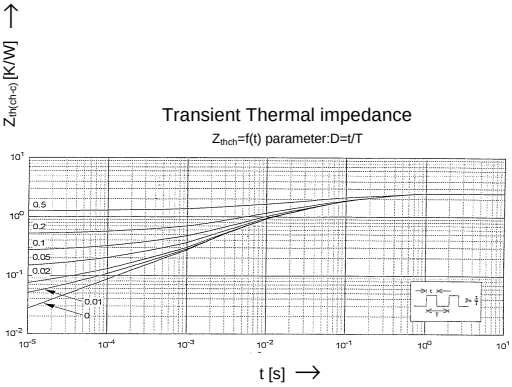
Safe Operation Area

$I_D=f(V_{DS})$: D=0,01, Tc=25°C



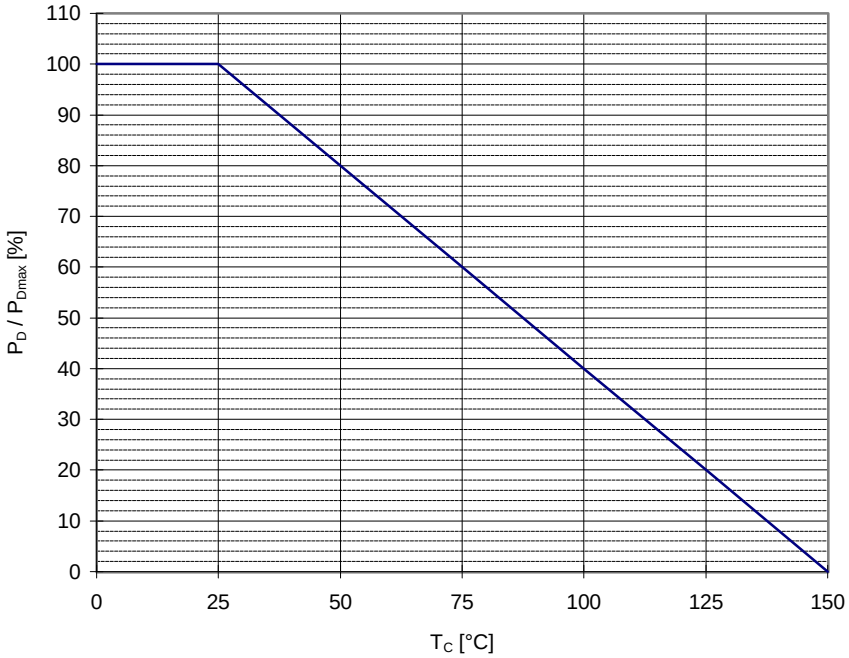
Transient Thermal impedance

$Z_{th}=f(t)$ parameter:D=t/T



> Characteristics

Power Dissipation
$P_D=f(T_C)$



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