FUJI ELECTRIC

2SK2897-01MR

FAP-IIIB Series

N-channel MOS-FET

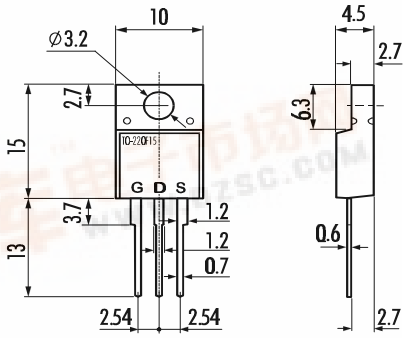
60V	0,02Ω	±45A	40W

> Features

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

> Outline Drawing

TO-220F15



> Applications

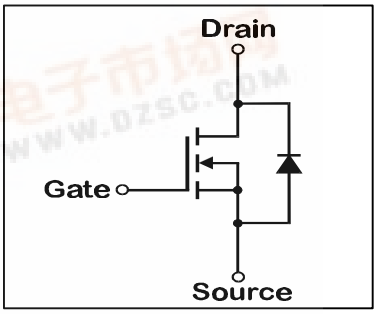
- Motor Control
- General Purpose Power Amplifier
- DC-DC converters

> 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	±45	A
Pulsed Drain Current	$I_{D(puls)}$	±185	A
Gate-Source-Voltage	V_{GS}	±20	V
Maximum Avalanche Energy	E_{AV}	461.9	mJ*
Max. Power Dissipation	P_D	40	W
Operating and Storage Temperature Range	T_{ch}	150	°C
	T_{stg}	-55 ~ +150	°C

L=0.304mH,Vcc=24V



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

Item	Symbol	Test conditions		Min.	Typ.	Max.	Unit
Drain-Source Breakdown-Voltage	BV_{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=22,5A	V_{GS}=4V		15	20	mΩ
		I_D=22,5A	V_{GS}=10V		10	12	mΩ
Forward Transconductance	g_{fs}	I_D=22,5A	V_{DS}=25V	15	35		S
Input Capacitance	C_{iss}	V_{DS}=25V			2900	4350	pF
Output Capacitance	C_{oss}	V_{GS}=0V			930	1400	pF
Reverse Transfer Capacitance	C_{rss}	f=1MHz			260	390	pF
Turn-On-Time t_{on} (t_{on}=$t_{d(on)}$+t_r)	$t_{d(on)}$	V_{CC}=30V			13	30	ns
	t_r	V_{GS}=10V			35	50	ns
Turn-Off-Time t_{off} (t_{on}=$t_{d(off)}$+t_f)	$t_{d(off)}$	I_D=45A			190	290	ns
	t_f	R_{GS}=10 Ω			75	140	ns
Avalanche Capability	I_{AV}	L = 100µH	T_{ch}=25°C	45			A
Diode Forward On-Voltage	V_{SD}	I_F=45A	V_{GS}=0V T_{ch}=25°C		0,95	1,43	V
Reverse Recovery Time	t_{rr}	I_F=45A	V_{GS}=0V		55		ns
Reverse Recovery Charge	Q_{rr}	-dI/dt=100A/µs	T_{ch}=25°C		0,10		µC

- Thermal Characteristics

Item	Symbol		Min.	Typ.	Max.	Unit
Thermal Resistance	$R_{th(ch-c)}$	channel to case			3,125	°C/W
	$R_{th(ch-a)}$	channel to ambient			62,5	°C/W

N-channel MOS-FET			
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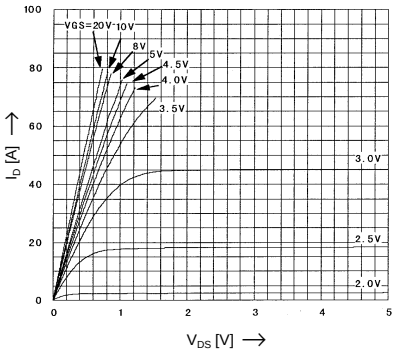
> Characteristics

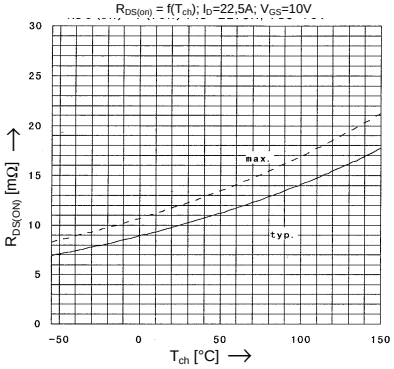
Typical Output Characteristics

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



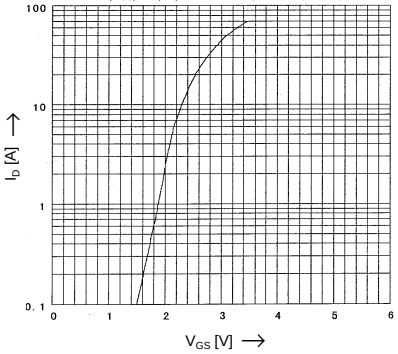
Drain-Source On-State Resistance vs. T_{ch}

$R_{DS(on)}=f(T_{ch})$; I_D=22,5A; V_{GS}=10V



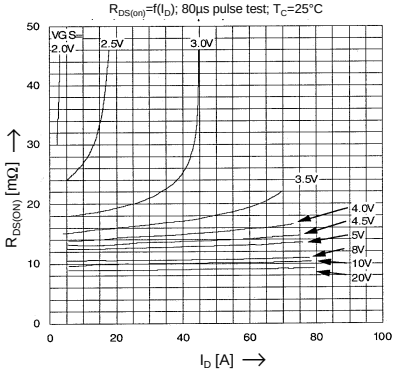
Typical Transfer Characteristics

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



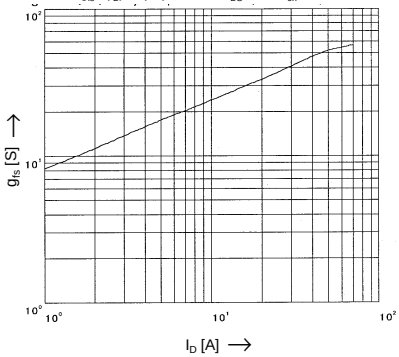
Typical Drain-Source On-State-Resistance vs. I_D

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



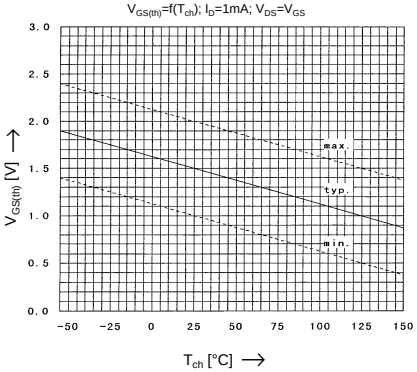
Typical Forward Transconductance vs. I_D

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



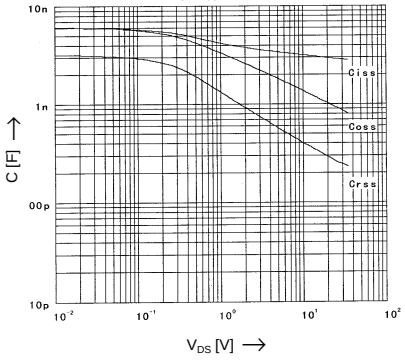
Gate Threshold Voltage vs. T_{ch}

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



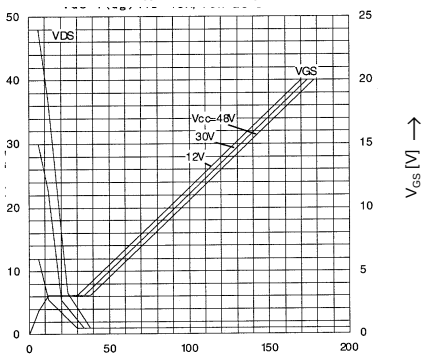
Typical Capacitances vs. V_{DS}

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



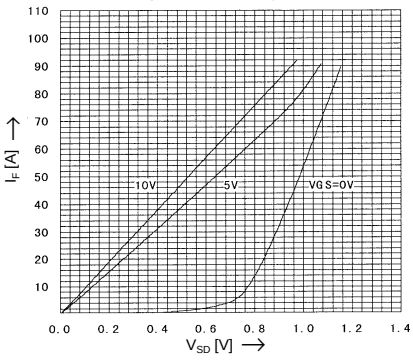
Typical Gate Charge Characteristic

$V_{GS}=f(Qg)$; I_D=45A; $T_C=25°C$



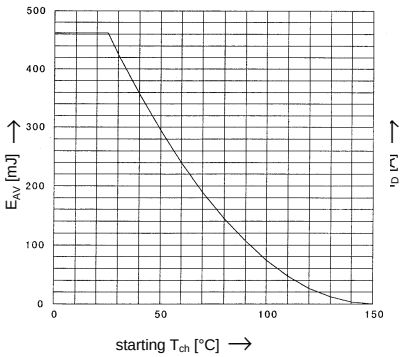
Forward Characteristics of Reverse Diode

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



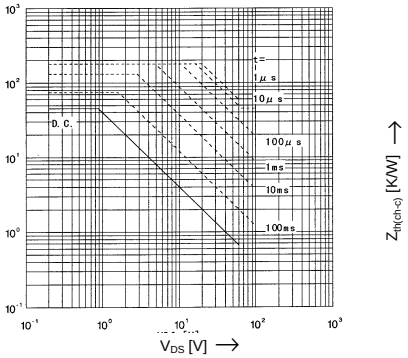
Maximum Avalanche Energy vs. starting T_{ch}

Eas=f(starting T_{ch}): V_{CC}=24V; I_{AV} ≤ 45A



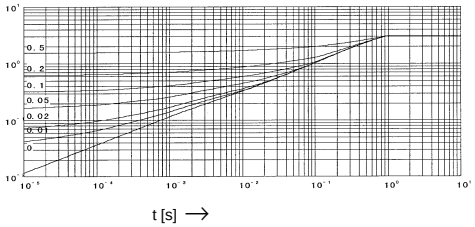
Safe Operation Area

$I_D=f(V_{DS})$: D=0,01, Tc=25°C



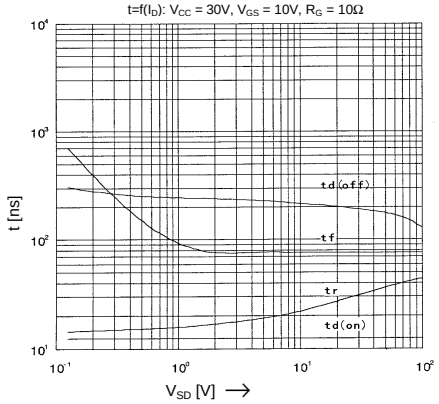
Transient Thermal impedance

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

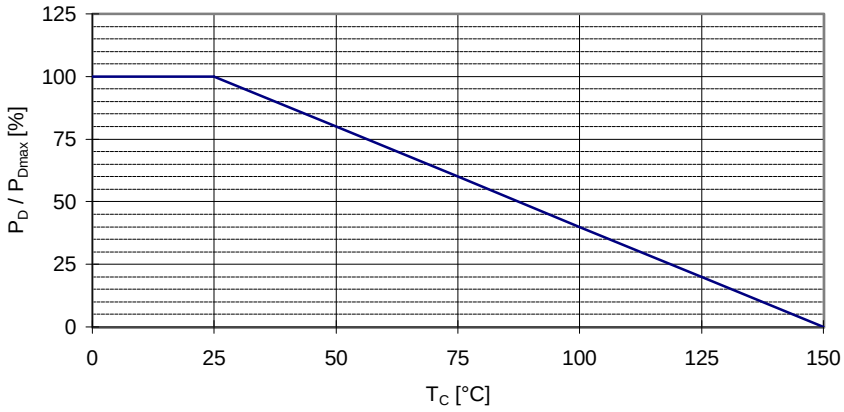


> Characteristics

Typical Switching Characteristics
$t=f(I_D)$: V_{CC} = 30V, V_{GS} = 10V, R_G = 10Ω



Power Dissipation
$P_D=f(T_C)$



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