FUJI ELECTRIC

2SK2879-01

FAP-IIS Series

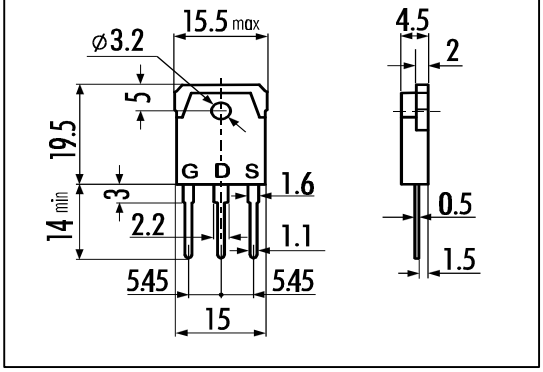
N-channel MOS-FET			
500V	0,38Ω	±20A	150W

> Features

- High Speed Switching
- Low On-Resistance
- No Secondary Breakdown
- Low Driving Power
- High Voltage
- VGS = ± 30V Guarantee
- Repetitive Avalanche Rated

> Outline Drawing

TO-3P



> Applications

- Switching Regulators
- UPS
- DC-DC converters
- General Purpose Power Amplifier

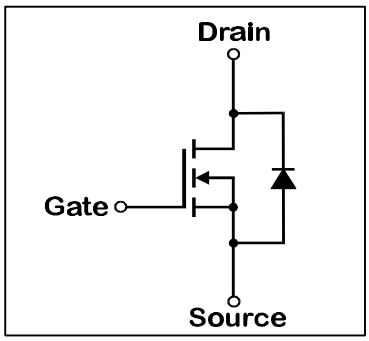
> Maximum Ratings and Characteristics

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

Item	Symbol	Rating	Unit
Drain-Source-Voltage	V_{DS}	500	V
Continous Drain Current	I_D	±20	A
Pulsed Drain Current	$I_{D(puls)}$	±80	A
Gate-Source-Voltage	V_{GS}	±30	V
Repetitive or Non-Repetitive ($T_{ch} \leq 150°C$)	I_{AR}	20	A
Avalanche Energy	E_{AS}	761	mJ
Max. Power Dissipation	P_D	150	W
Operating and Storage Temperature Range	T_{ch}	150	°C
	T_{stg}	-55 ~ +150	°C

L=34.9mH,Vcc=50V

> Equivalent Circuit



- 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	500			V
Gate Threshhold Voltage	$V_{GS(th)}$	I_D=1mA	V_{DS}=V_{GS}	2,5	3,0	3,5	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=500V	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}=±30V	V_{DS}=0V		10	100	nA
Drain Source On-State Resistance	$R_{DS(on)}$	I_D=10A	V_{GS}=10V		0,33	0,38	Ω
Forward Transconductance	g_{fs}	I_D=10A	V_{DS}=25V	7,5	15		S
Input Capacitance	C_{iss}	V_{DS}=25V			2200	3300	pF
Output Capacitance	C_{oss}	V_{GS}=0V			330	500	pF
Reverse Transfer Capacitance	C_{rss}	f=1MHz			140	210	pF
Turn-On-Time t_{on} (t_{on}=$t_{d(on)}$+t_r)	$t_{d(on)}$	V_{CC}=300V			20	30	ns
	t_r	I_D=20A			160	240	ns
Turn-Off-Time t_{off} (t_{on}=$t_{d(off)}$+t_f)	$t_{d(off)}$	V_{GS}=10V			130	200	ns
	t_f	R_{GS}=10 Ω			105	160	ns
Avalanche Capability	I_{AV}	L = 3,49mH	T_{ch}=25°C	20			A
Diode Forward On-Voltage	V_{SD}	I_F=2xI_{DR}	V_{GS}=0V T_{ch}=25°C		1,1	1,7	V
Reverse Recovery Time	t_{rr}	I_F=I_{DR}	V_{GS}=0V		650		ns
Reverse Recovery Charge	Q_{rr}	-dI_F/dt=100A/µs	T_{ch}=25°C		10,0		µC

- Thermal Characteristics

Item	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Thermal Resistance	$R_{th(ch-c)}$	channel to case			0,83	°C/W
	$R_{th(ch-a)}$	channel to air			35,0	°C/W

N-channel MOS-FET			
500V	0,38Ω	±20A	150W

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FAP-IIS Series

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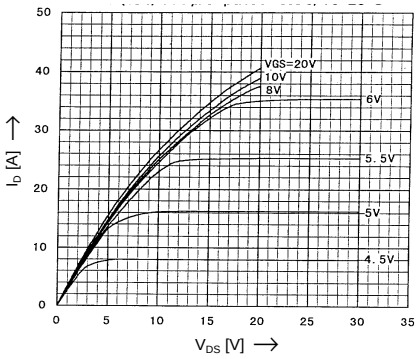
> Characteristics

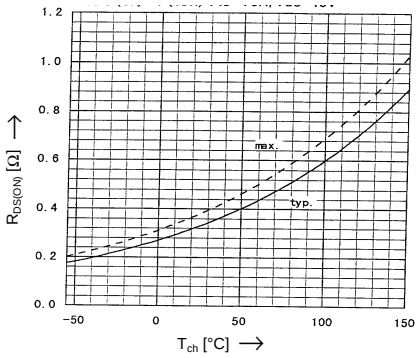
Typical Output Characteristics

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



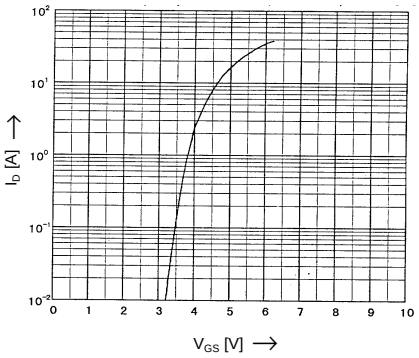
Drain-Source-On-State Resistance vs. T_{ch}

$R_{DS(on)} = f(T_{ch})$: ID=10A; VGS=10V



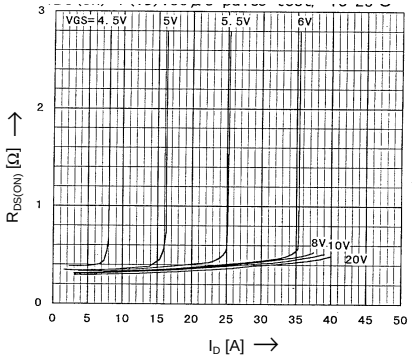
Typical Transfer Characteristics

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



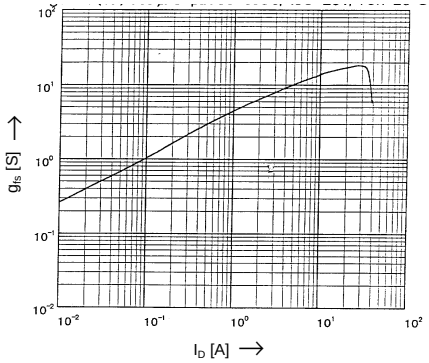
Typical Drain-Source-On-State-Resistance vs. I_D

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



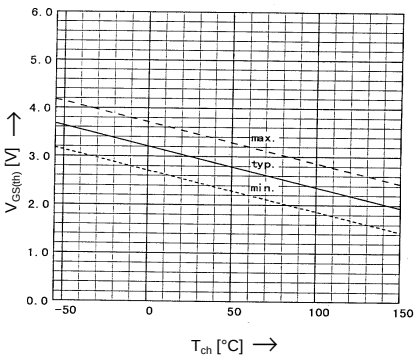
Typical Forward Transconductance vs. I_D

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



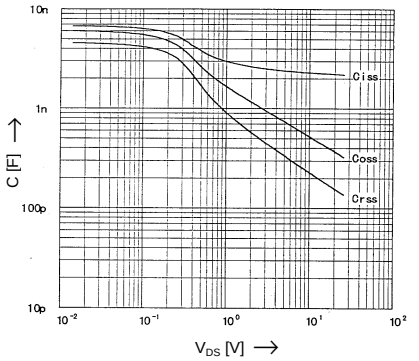
Gate Threshold Voltage vs. T_{ch}

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



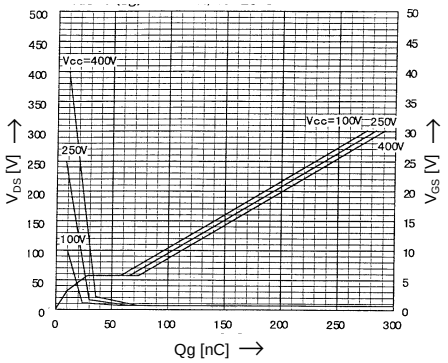
Typical Capacitances vs. V_{DS}

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



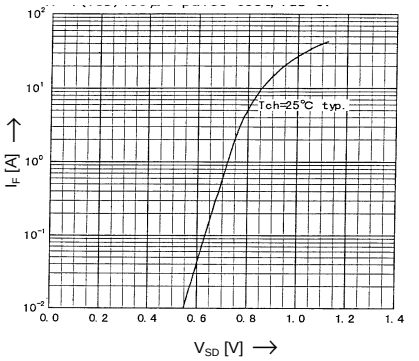
Typical Gate Charge Characteristic

VGS=f(Qg): ID=20A; Tc=25°C



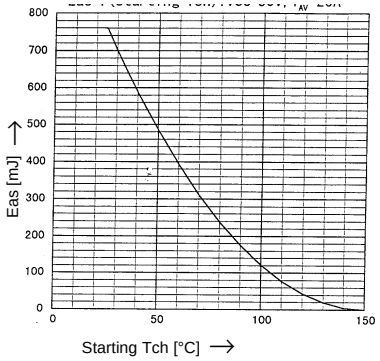
Forward Characteristics of Reverse Diode

$I_F=f(V_{SD})$; 80µs pulse test; $V_{GS}=0V$



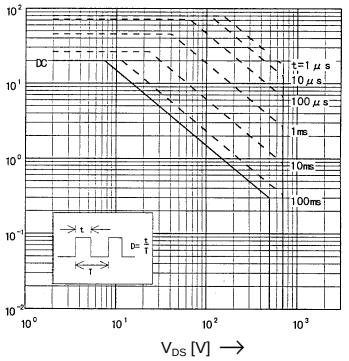
Avalanche Energy Derating

Eas=f(starting Tch): Vcc=50V; I_{AV}=20A



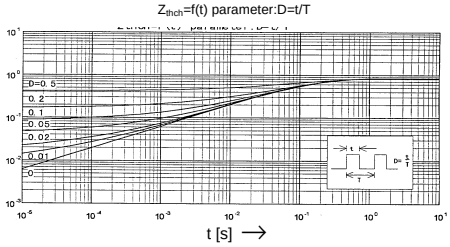
Safe operation area

$I_D=f(V_{DS})$: D=0,01, Tc=25°C



Transient Thermal impedance

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



> Characteristics

Power Dissipation
$P_D=f(T_C)$