FUJI ELECTRIC

2SK1389

F-III Series

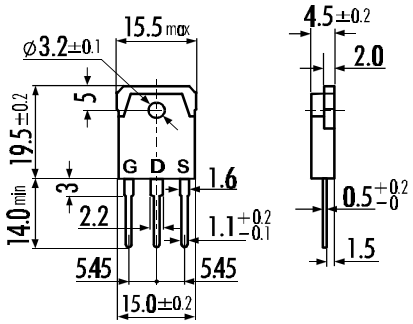
N-channel MOS-FET			
60V	0,025Ω	50A	125W

> Features

- High Current
- Low On-Resistance
- No Secondary Breakdown
- Low Driving Power
- High Forward Transconductance

> Outline Drawing

TO-3P



> Applications

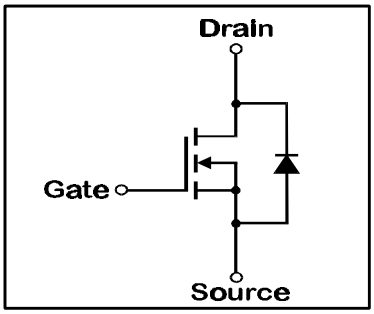
- Motor Control
- General Purpose Power Amplifier
- DC-DC converters

> 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
Continous Reverse Drain Current	I_{DR}	50	A
Gate-Source-Voltage	V_{GS}	±20	V
Max. Power Dissipation	P_D	125	W
Operating and Storage Temperature Range	T_{ch}	150	°C
	T_{stg}	-55 ~ +150	°C

> 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	2,5	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=25A	V_{GS}=4V		0,022	0,04	Ω
		I_D=25A	V_{GS}=10V		0,015	0,025	Ω
Forward Transconductance	g_{fs}	I_D=25A	V_{DS}=25V	20	36		S
Input Capacitance	C_{iss}	V_{DS}=25V			2600	3900	pF
Output Capacitance	C_{oss}	V_{GS}=0V			800	1200	pF
Reverse Transfer Capacitance	C_{rss}	f=1MHz			400	600	pF
Turn-On-Time t_{on} (t_{on}=$t_{d(on)}$+t_r)	$t_{d(on)}$	V_{CC}=30V			20	30	ns
	t_r	I_D=50A			130	200	ns
Turn-Off-Time t_{off} (t_{on}=$t_{d(off)}$+t_f)	$t_{d(off)}$	V_{GS}=10V			400	600	ns
	t_f	R_{GS}=25 Ω			170	250	ns
Diode Forward On-Voltage	V_{SD}	I_F=2xI_{DR}	V_{GS}=0V T_{ch}=25°C		1,35	2,0	V
Reverse Recovery Time	t_{rr}	I_F=I_{DR}	V_{GS}=0V		100		ns
		-dI_F/dt=100A/µs	T_{ch}=25°C				

- Thermal Characteristics

Item	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Thermal Resistance	$R_{th(ch-a)}$	channel to air			35	°C/W
	$R_{th(ch-c)}$	channel to case			1,0	°C/W

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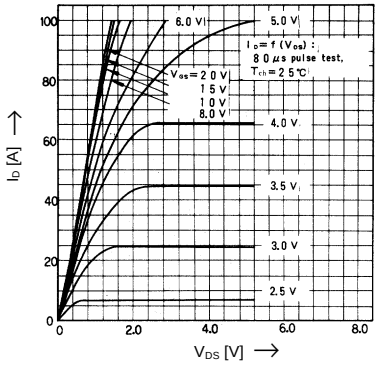
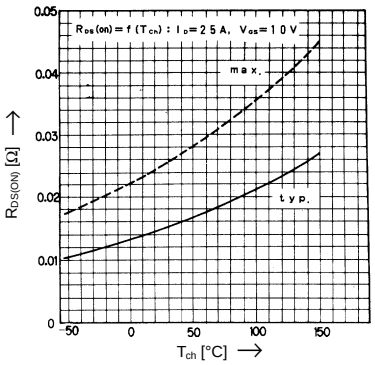
> Characteristics

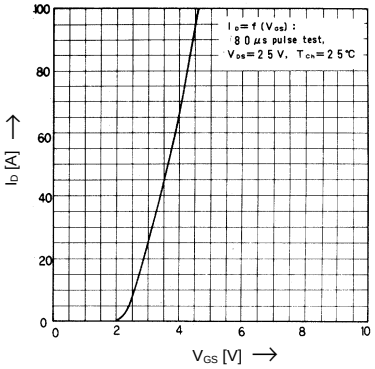
Typical Output Characteristics



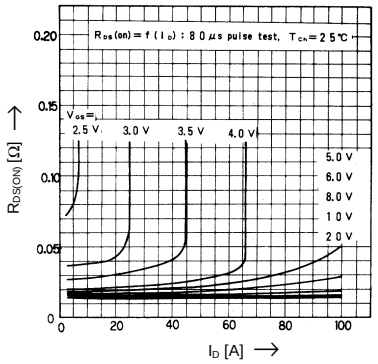
Drain-Source-On-State Resistance vs. T_{ch}



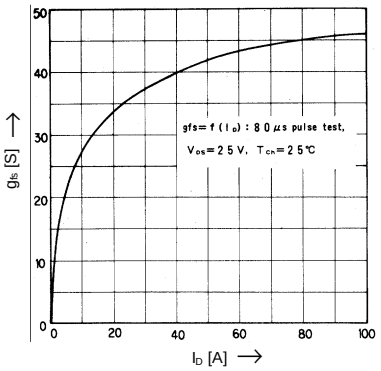
Typical Transfer Characteristics



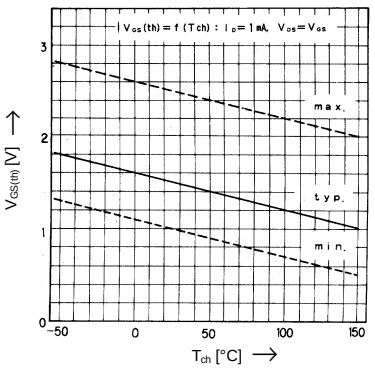
Typical Drain-Source-On-State-Resistance vs. I_D



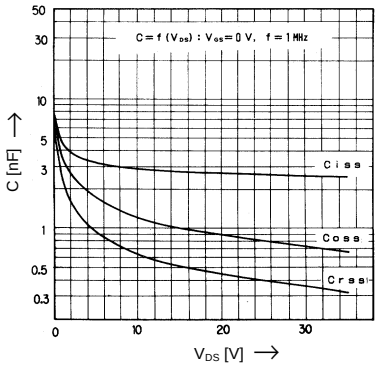
Typical Forward Transconductance vs. I_D



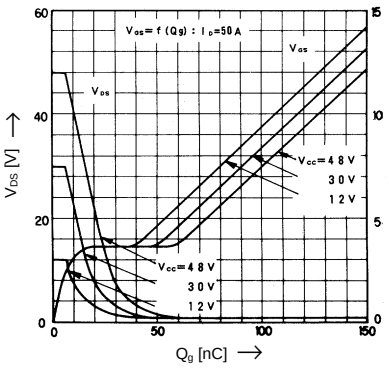
Gate Threshold Voltage vs. T_{ch}



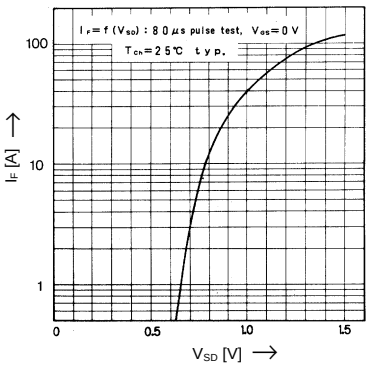
Typical Capacitance vs. V_{DS}



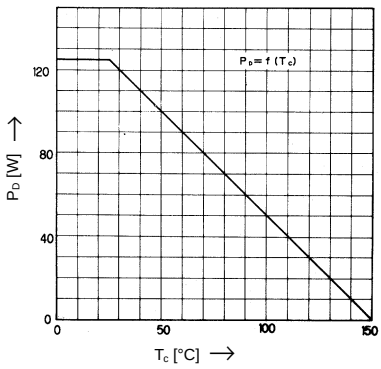
Typical Input Charge



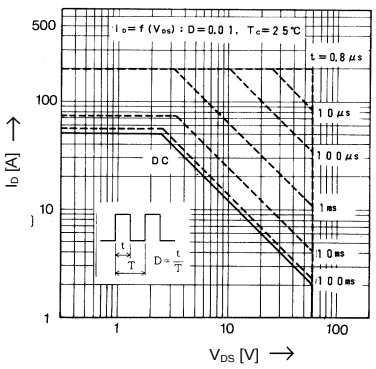
Forward Characteristics of Reverse Diode



Allowable Power Dissipation vs. T_C



Safe operation area



Transient Thermal impedance