

# 2SK1212-01

SIPMOS® FUJI POWER MOS-FET

N-CHANNEL SILICON POWER MOS-FET

## F-I SERIES

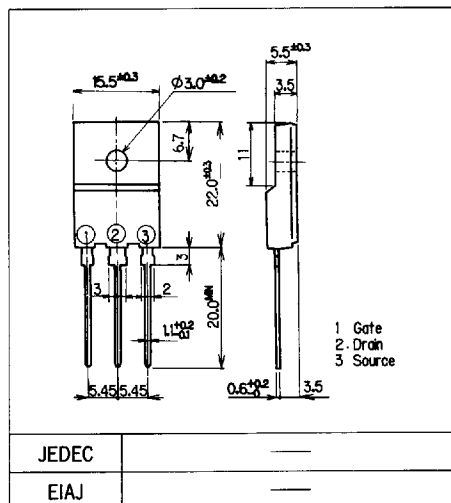
### Features

- High current
- Low on-resistance
- No secondary breakdown
- Low driving power
- Avalanche-proof

### Applications

- DC-DC converters
- Motor controllers
- General purpose power amplifier

### Outline Drawings

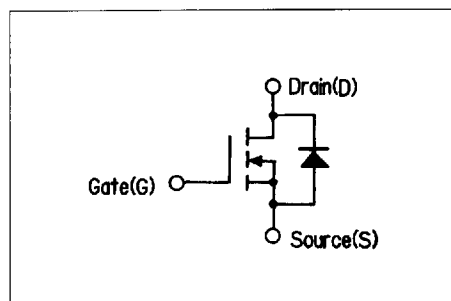


### Max. Ratings and Characteristics

#### Absolute Maximum Ratings(Tc=25°C)

Items	Symbols	Ratings	Units
Drain-source voltage	$V_{DSS}$	900	V
Continuous drain current	$I_D$	5	A
Pulsed drain current	$I_{D(puls)}$	20	A
Continuous reverse drain current	$I_{DR}$	5	A
Gate-source peak voltage	$V_{GSS}$	$\pm 20$	V
Max. power dissipation	$P_D$	80	W
Operating and storage temperature range	$T_{ch}$	150	°C
	$T_{stg}$	-55 ~ +150	°C

### Equivalent Circuit Schematic



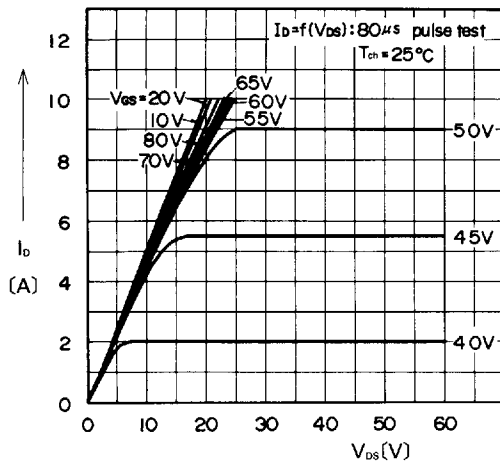
#### Electrical Characteristics(Tc=25°C)

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units	
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D = 1mA$ $V_{GS} = 0V$	900			V	
Gate threshold voltage	$V_{GS(th)}$	$I_D = 1mA$ $V_{DS} = V_{GS}$	2.1	3.0	4.0	V	
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 900V$ $V_{GS} = 0V$	$T_{ch} = 25^\circ C$		10	500	$\mu A$
			$T_{ch} = 125^\circ C$		0.2	1.0	mA
Gate-source leakage current	$I_{GSS}$	$V_{GS} = \pm 20V$ $V_{DS} = 0V$		10	100	nA	
Drain-source on-state resistance	$R_{DS(on)}$	$I_D = 2.5A$ $V_{GS} = 10V$		2.0	2.5	$\Omega$	
Forward transconductance	$g_{fs}$	$I_D = 2.5A$ $V_{DS} = 25V$	3.0	6.0		S	
Input capacitance	$C_{iss}$	$V_{DS} = 25V$ $V_{GS} = 0V$ $f = 1MHz$		1500	2400	pF	
Output capacitance	$C_{oss}$			150	240		
Reverse transfer capacitance	$C_{rss}$			50	80		
Turn-on time $t_{on}$ ( $t_{on} + t_{d(on)} + t_r$ )	$t_{d(on)}$	$V_{CC} = 30V$ $I_D = 2.4A$ $V_{GS} = 10V$ $R_C = 50\Omega$		30	50	ns	
	$t_r$			80	120		
	$t_{d(off)}$			300	450		
Turn-off time $t_{off}$ ( $t_{d(off)} + t_f$ )	$t_f$			120	180		
Diode forward on-voltage	$V_{SD}$	$I_F = 2 \times I_{DR}$ $V_{GS} = 0V$ $T_{ch} = 25^\circ C$		1.0	1.5	V	
Reverse recovery time	$t_{rr}$	$I_F = I_{DR}$ $di/dt = 100A/\mu s$ $T_{ch} = 25^\circ C$		900		ns	

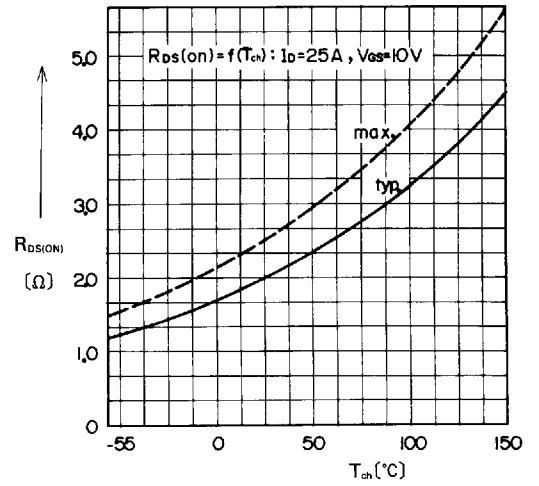
#### Thermal Characteristics

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance	$R_{th(ch-a)}$	channel to air			30.0	°C/W
	$R_{th(ch-c)}$	channel to case			1.56	°C/W

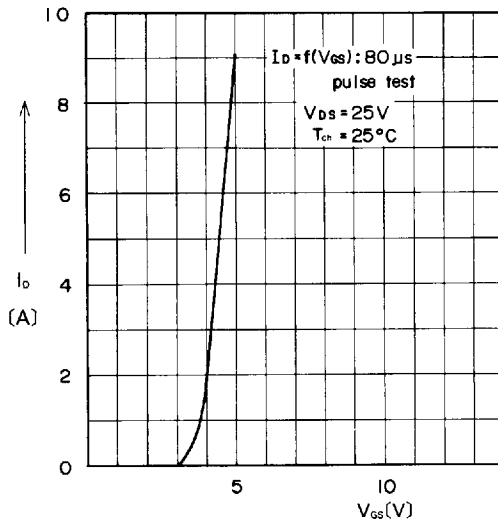
■ Characteristics



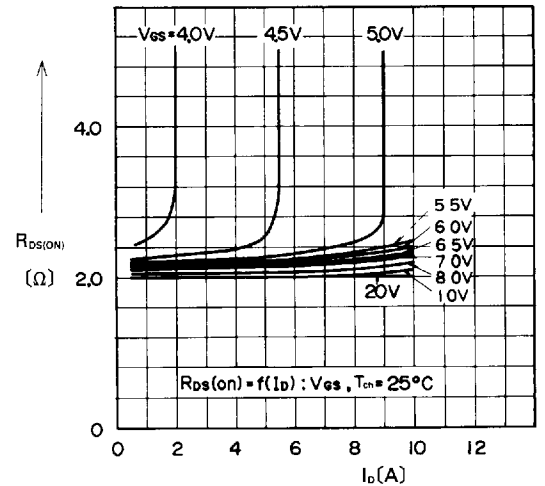
Typical Output Characteristics



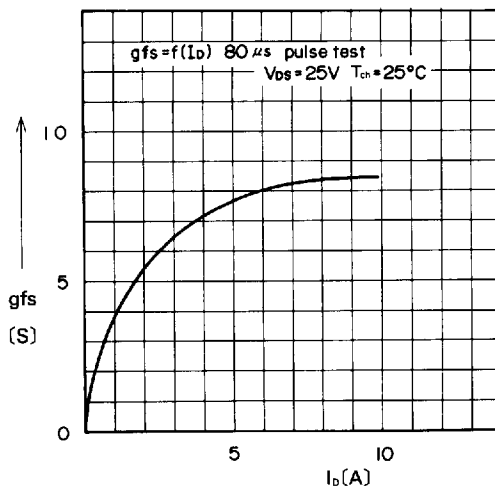
On State Resistance vs.  $T_{ch}$



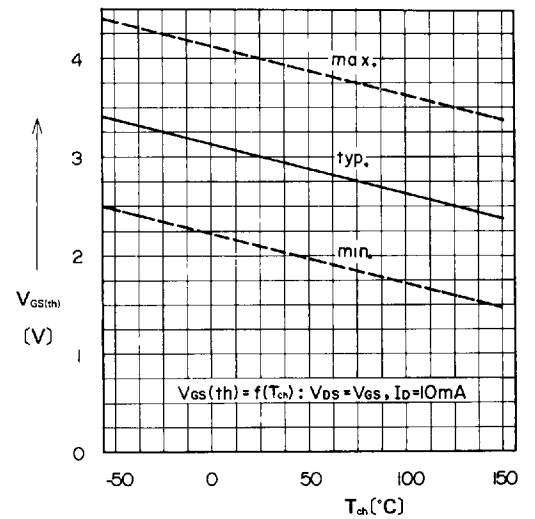
Typical Transfer Characteristics



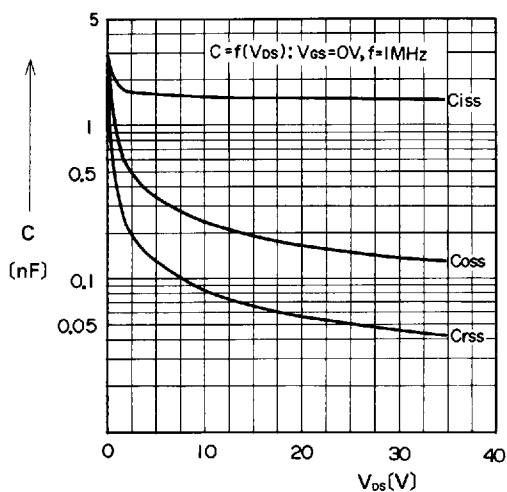
Typical Drain-Source on State Resistance vs.  $I_D$



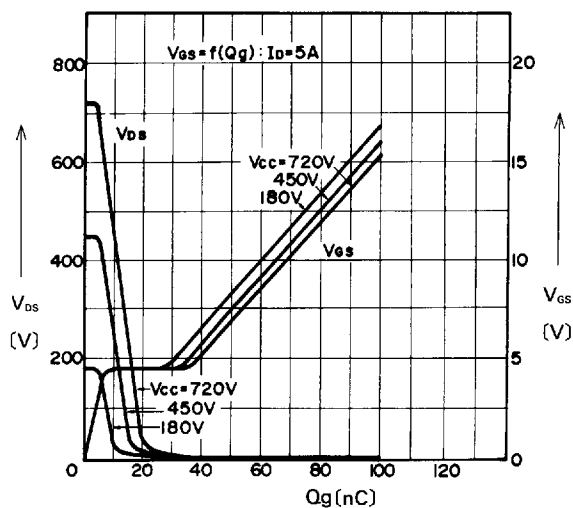
Typical Forward Transconductance vs.  $I_D$



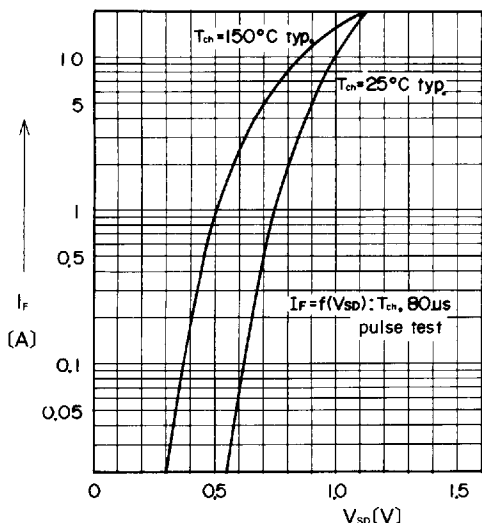
Gate Threshold Voltage vs.  $T_{ch}$



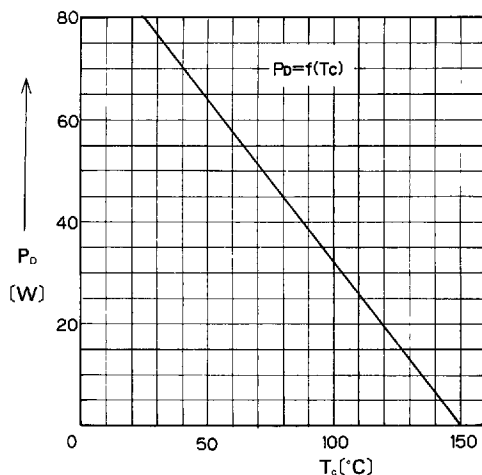
Typical Capacitance vs. V<sub>DS</sub>



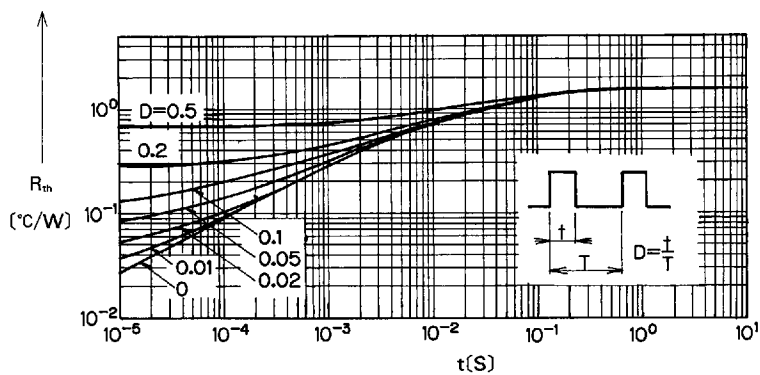
Typical Input Charge



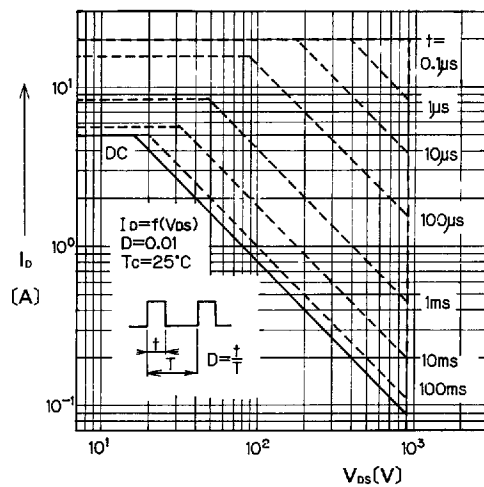
Forward Characteristics of Reverse Diode



Allowable Power Dissipation vs. T<sub>c</sub>



Transient Thermal Impedance



Safe Operating Area

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