

# 2SK903

SIPMOS® FUJI POWER MOS-FET

N-CHANNEL SILICON POWER MOS-FET

## F-I SERIES

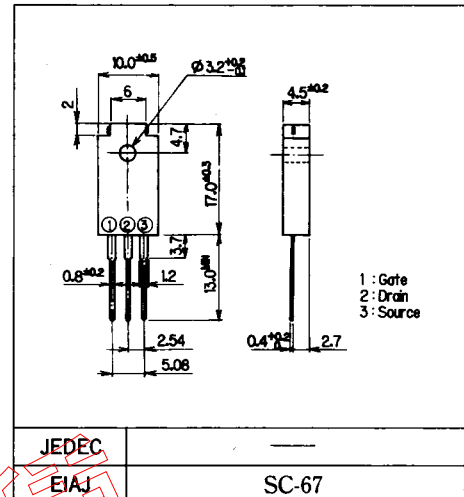
### Features

- High speed switching
- Low on-resistance
- No secondary breakdown
- Low driving power
- High voltage

### Applications

- Switching regulators
- UPS
- DC-DC converters
- General purpose power amplifier

### Outline Drawings

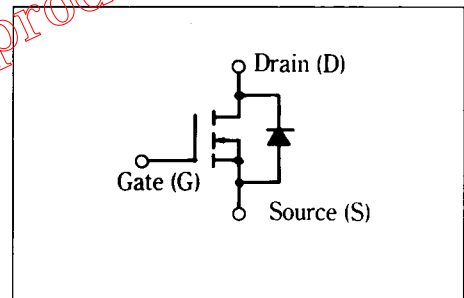


### Max. Ratings and Characteristics

● Absolute Maximum Ratings (T<sub>c</sub> = 25°C)

Items	Symbols	Ratings	Units
Drain-source voltage	V <sub>DSS</sub>	800	V
Continuous drain current	I <sub>D</sub>	3	A
Pulsed drain current	I <sub>D(pulse)</sub>	12	A
Continuous reverse drain current	I <sub>DR</sub>	3	A
Gate-source peak voltage	V <sub>GSS</sub>	±20	V
Max. power dissipation	P <sub>D</sub>	40	W
Operating and storage temperature range	T <sub>ch</sub>	150	°C
	T <sub>stg</sub>	-55 ~ +150	°C

### Equivalent Circuit Schematic

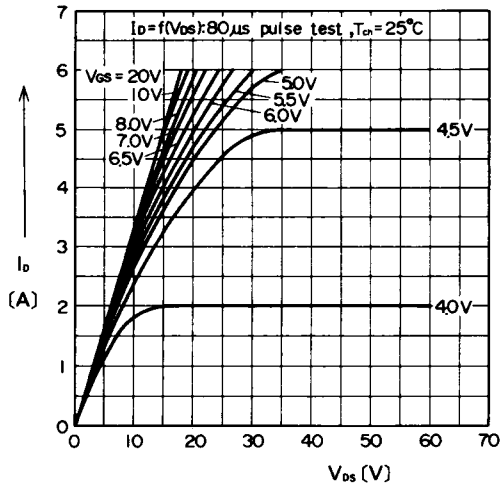


● Electrical Characteristics (T<sub>c</sub> = 25°C)

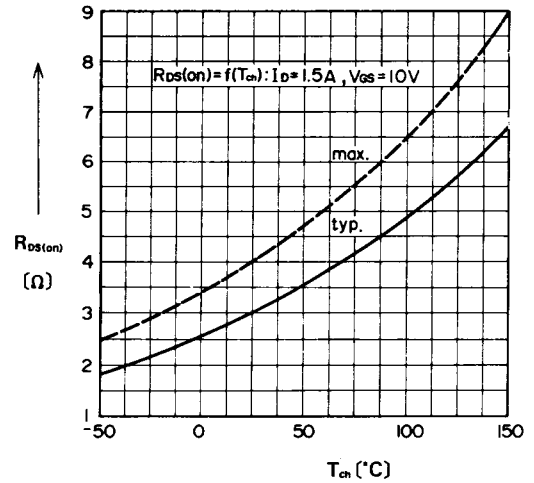
Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> = 1mA V <sub>GS</sub> = 0V	800			V
Gate threshold voltage	V <sub>GS(th)</sub>	I <sub>D</sub> = 10mA V <sub>DS</sub> = V <sub>GS</sub>	2.1	3.0	4.0	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = 800V V <sub>GS</sub> = 0V T <sub>ch</sub> = 25°C		10	500	μA
Gate-source leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V V <sub>DS</sub> = 0V		10	100	nA
Drain-source on-state resistance	R <sub>DS(on)</sub>	I <sub>D</sub> = 1.5A V <sub>GS</sub> = 10V		3.0	4.0	Ω
Forward transconductance	g <sub>fs</sub>	I <sub>D</sub> = 1.5A V <sub>DS</sub> = 25V	2.0	4.0		S
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 25V V <sub>GS</sub> = 0V f = 1MHz		900	1400	pF
Output capacitance	C <sub>oss</sub>			90	140	
Reverse transfer capacitance	C <sub>rss</sub>			35	60	
Switching time (t <sub>off</sub> = t <sub>d(off)</sub> + t <sub>f</sub> )	t <sub>on</sub>	V <sub>CC</sub> = 30V R <sub>G</sub> = 50Ω		60	90	ns
	t <sub>d(off)</sub>	I <sub>D</sub> = 2.1A		150	250	
	t <sub>f</sub>	V <sub>GS</sub> = 10V		60	90	
Diode forward on-voltage	V <sub>SD</sub>	I <sub>F</sub> = 2 × I <sub>DR</sub> V <sub>GS</sub> = 0V T <sub>ch</sub> = 25°C		1.0	1.35	V
Reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> = I <sub>DR</sub> d <sub>i</sub> /d <sub>t</sub> = 100A/μs T <sub>ch</sub> = 25°C		400		ns

● Thermal Characteristics

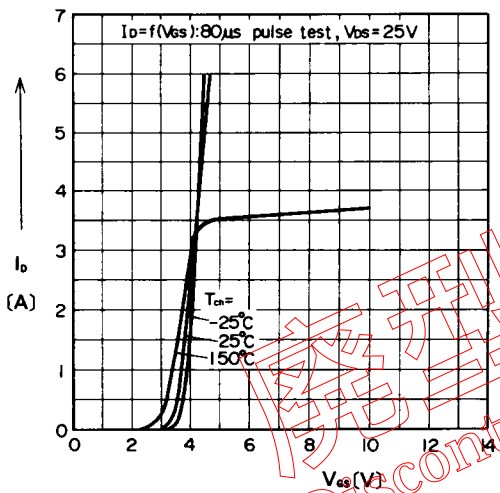
Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance	R <sub>th(ch-a)</sub>	channel to air			62.5	°C/W
	R <sub>th(ch-c)</sub>	channel to case			3.125	°C/W



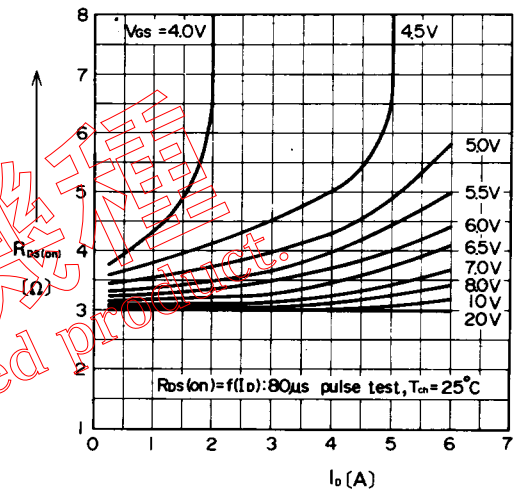
Typical Output Characteristics



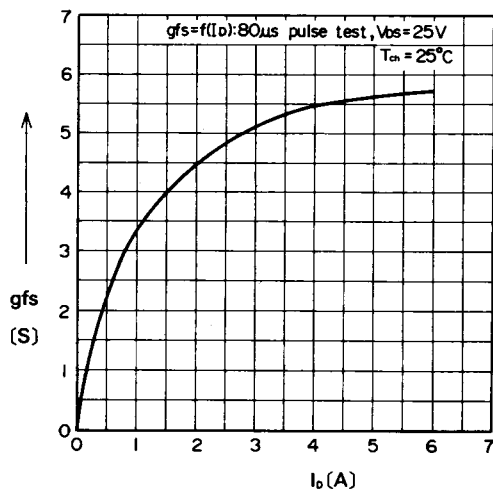
On State Resistance vs.  $T_{ch}$



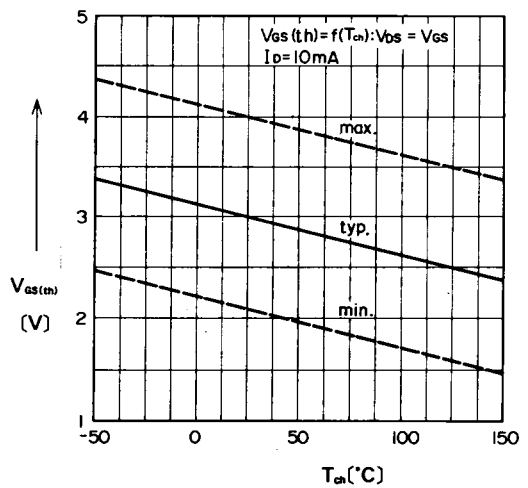
Typical Transfer Characteristic



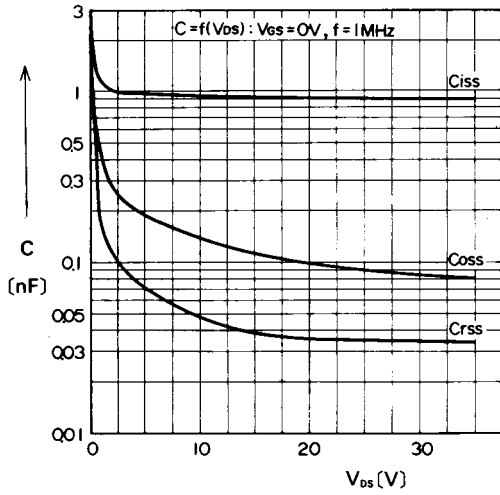
Typical Drain-Source on State Resistance vs.  $I_D$



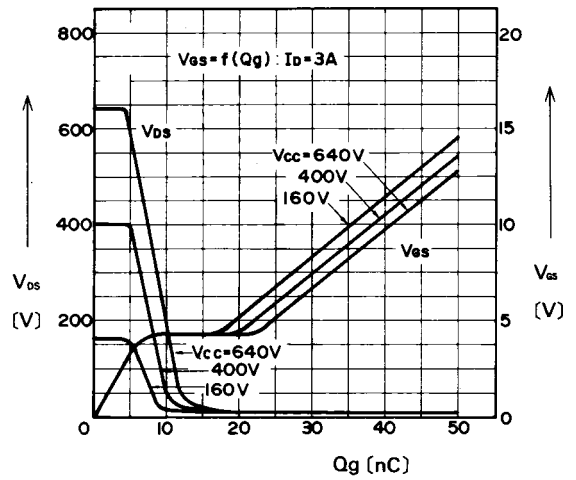
Typical Forward Transconductance vs.  $I_D$



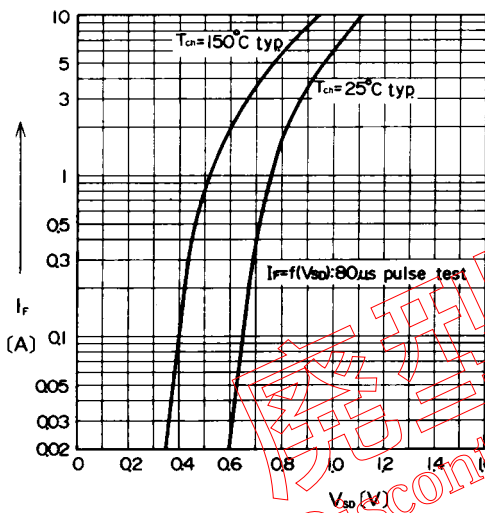
Gate Threshold Voltage vs  $T_{ch}$



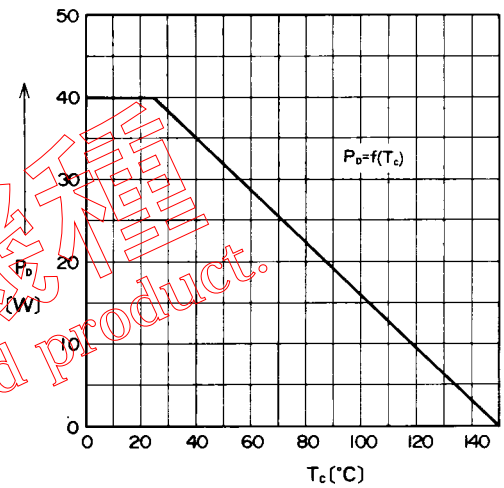
Typical Capacitance vs.  $V_{DS}$



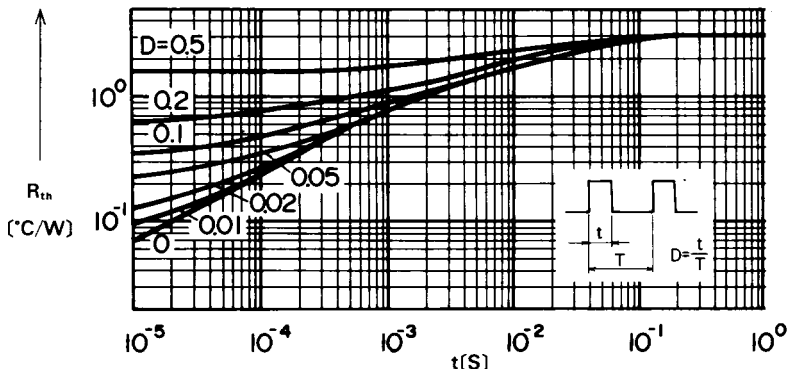
Typical Input Charge



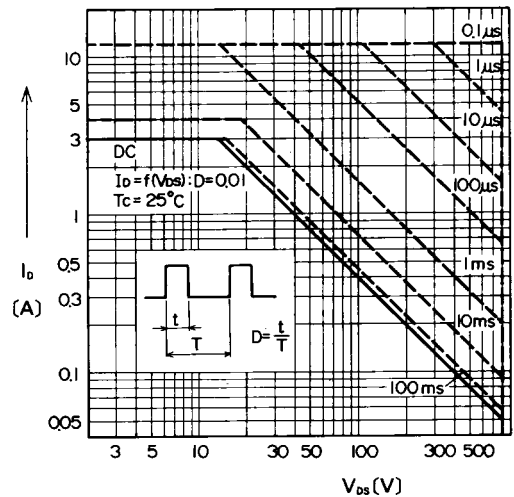
Forward Characteristics of Reverse Diode



Allowable Power Dissipation vs.  $T_c$



Transient Thermal Impedance



Safe Operating Area