2SK2051-L, S SIPMOS® FUJI POWER MOS-FET

N-CHANNEL SILICON POWER MOS-FET

F-II SERIES

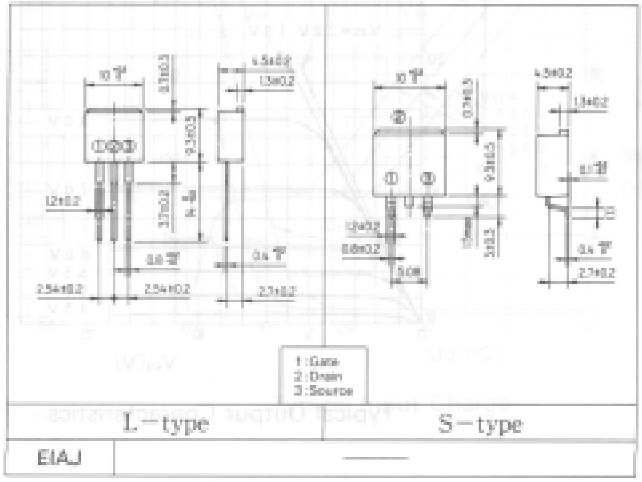
■Features

- High speed switching
- Low on-resistance
- No secondary breakdown
- Low driving power
- High voltage
- $V_{GS}=\pm30V$ Guarantee

■Applications

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

■Outline Drawings

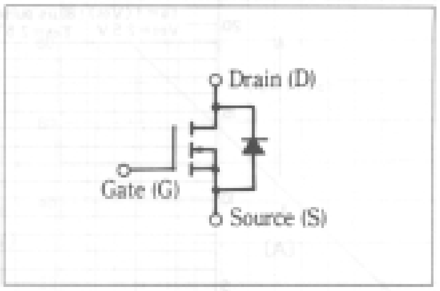


■Max. Ratings and Characteristics

●Absolute Maximum Ratings(Tc=25°C)
(unless otherwise specified)

Items	Symbols	Ratings	Units
Drain-source voltage	V_{DS}	250	V
Drain-gate voltage (R_{GS}=20KΩ)	V_{DGR}	250	V
Continuous drain current	I_D	10	A
Pulsed drain current	$I_{D(puls)}$	28	A
Gate-source voltage	V_{GS}	±30	V
Max. power dissipation	P_D	80	W
Operating and storage	T_{ch}	150	°C
temperature range	T_{stg}	−55∼+150	°C

■Equivalent Circuit Schematic



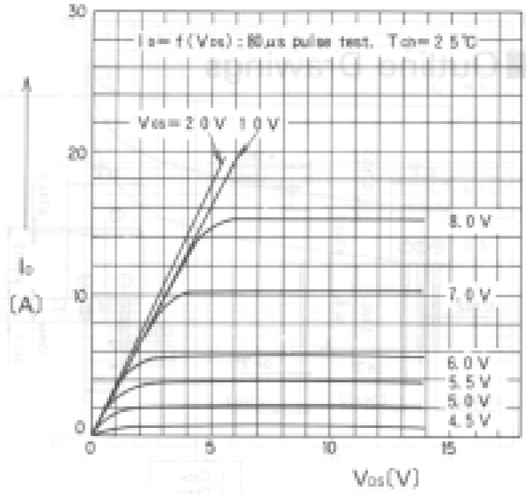
●Electrical Characteristics(Tc=25°C) (unless otherwise specified)

Items	Symbols	Test Conditions		Min.	Typ.	Max.	Units
Drain-source breakdown voltage	$V_{(BR)DSS}$	I_D=1mA V_{GS}=0V		250			V
Gate threshold 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}=250V	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=5A	V_{GS}=10V		0.3	0.4	Ω
Forward transconductance	g_{fs}	I_D=5A V_{DS}=25V		2.0	4.5		S
Input capacitance	C_{iss}	V_{DS}=25V			570	860	pF
Output capacitance	C_{oss}	V_{GS}=0V			140	120	
Reverse transfer capacitance	C_{rss}	f =1MHz			70	110	
Turn-on time t_{on}	$td_{(on)}$	V_{CC}=150V I_D=10A			20	30	ns
($t_{on}=t_{d(on)}+t_r$)	t_r	V_{GS}=10V			40	60	
Turn-off time t_{off}	$td_{(off)}$	R_{GS}=25Ω			100	150	
($t_{off}=t_{d(off)}+t_f$)	t_f				50	75	
Continuous reverse drain current	I_{DR}					10	A
Pulsed reverse drain current	I_{DRM}					28	A
Diode forward on-voltage	V_{SD}	$I_F=2\times I_{DR}$ V_{GS}=0V T_{ch}=25°C			1.12	1.68	V
Reverse recovery time	t_{rr}	$I_F=I_{DR}$ V_{GS}=0V			140		ns
Reverse recovery charge	Q_{rr}	$-dI_F/d_t$=100A/μs T_{ch}=25°C			0.85		μC

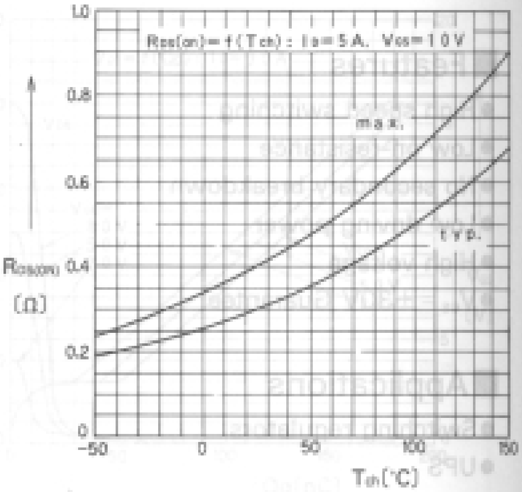
●Thermal Characteristics

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-a)}$	channel to air			75	°C/W
	$R_{th(ch-c)}$	channel to case			1.56	°C/W

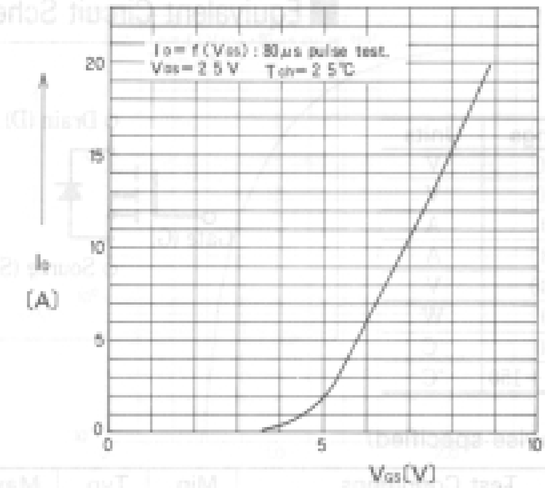
Characteristics



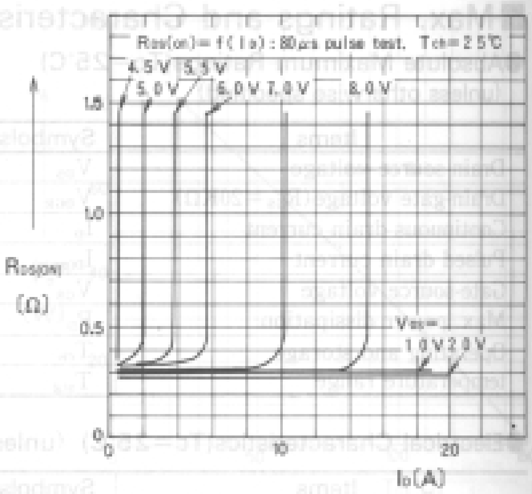
Typical Output Characteristics



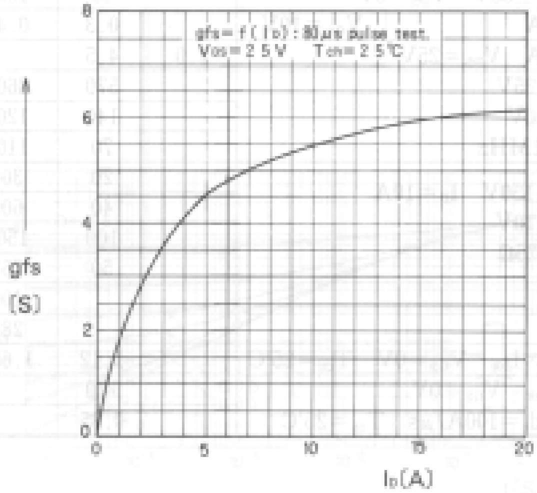
Drain-Source on-State Resistance vs. Tch



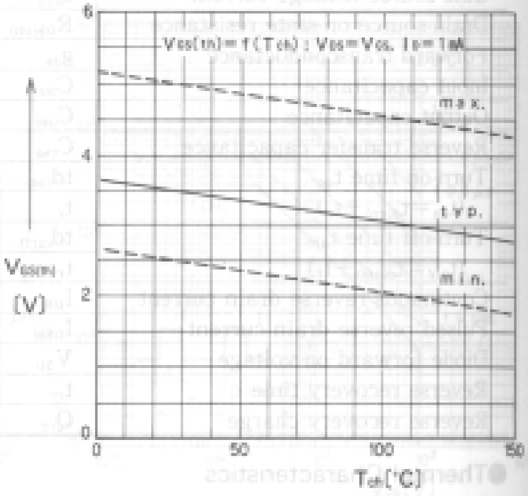
Typical Transfer Characteristics



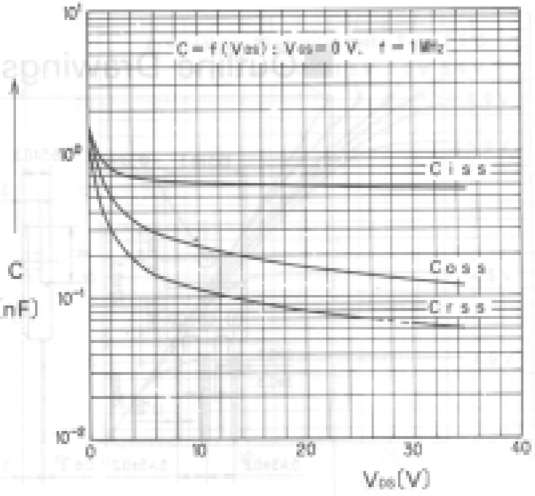
Typical Drain-Source on-State Resistance vs. I_D



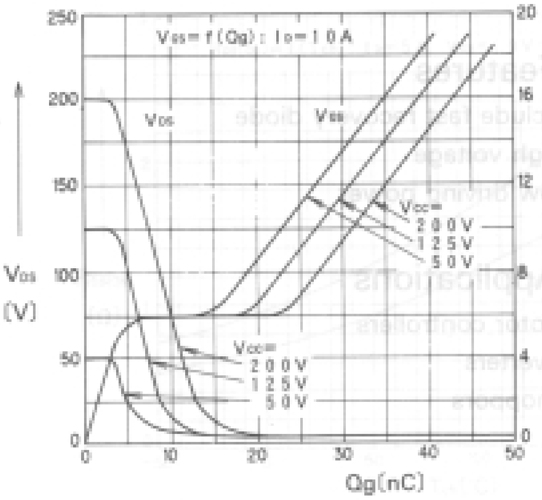
Typical Forward Transconductance vs. I_D



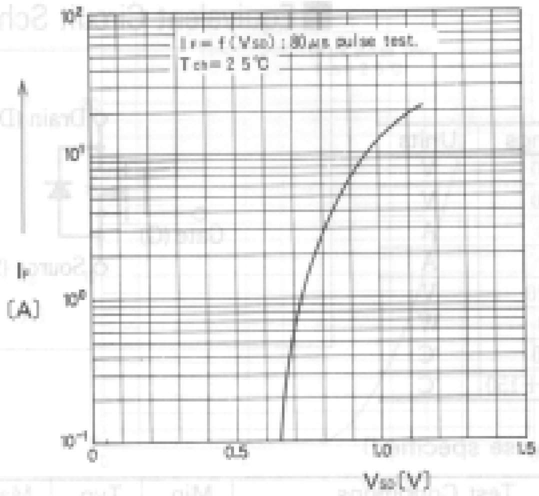
Gate Threshold Voltage vs. Tch



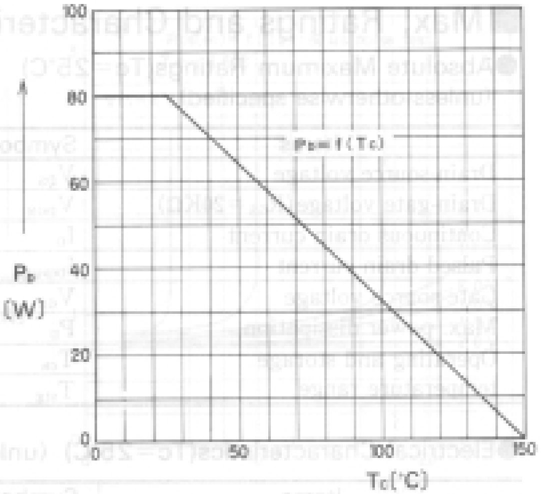
Typical Capacitance vs. V_{DS}



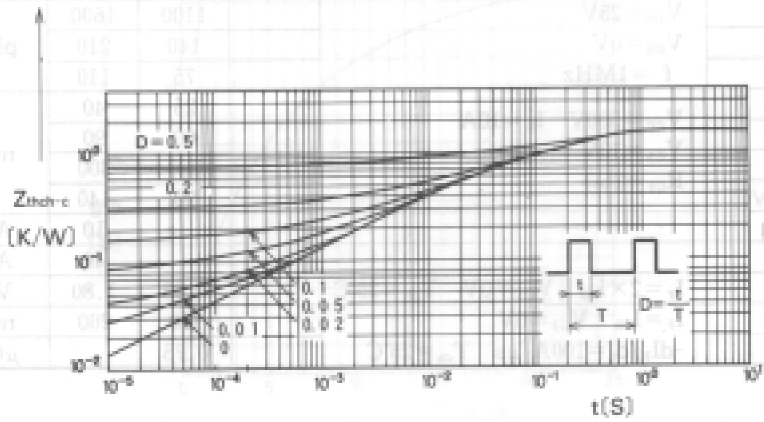
Typical Input Charge



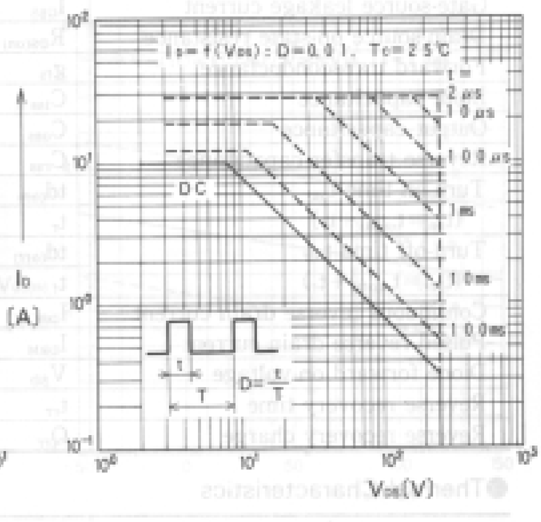
Forward Characteristics of Reverse Diode



Allowable Power Dissipation vs. T_C



Transient Thermal Impedance



Safe Operating Area