2SK2259-01M SIPMOS® FUJI POWER MOS-FET

N-CHANNEL SILICON POWER MOS-FET

FAP-IIIA SERIES

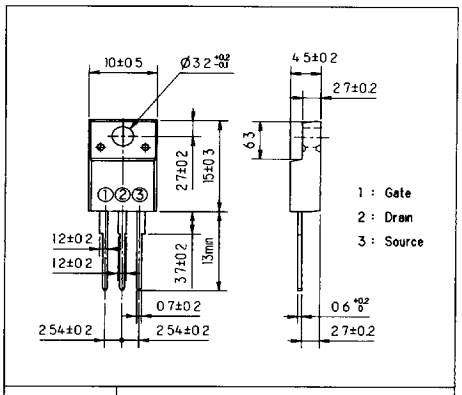
■ Features

- High current
- Low on-resistance
- No secondary breakdown
- Low driving power
- High forward Transconductance
- Avalanche-proof
- Including G-S Zenner diode

■ Applications

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

■ Outline Drawings



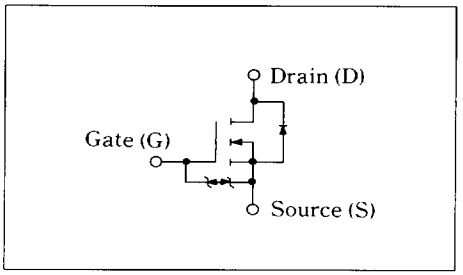
JEDEC	——
EIAJ	SC-67

■ Max. Ratings and Characteristics

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

Items	Symbols	Ratings	Units
Drain-source voltage	V_{DS}	60	V
Drain-gate voltage (R_{GS}=20KΩ)	V_{DGR}	60	V
Continuous drain current	I_D	40	A
Pulsed drain current	$I_{D(puls)}$	160	A
Gate-source voltage	V_{GS}	±20	V
Max. power dissipation	P_D	40	W
Operating and storage temperature range	T_{ch}	150	°C
	T_{stg}	−55～+150	°C

■ Equivalent Circuit Schematic



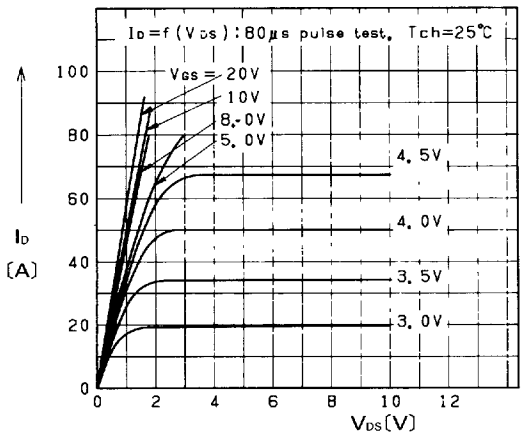
●Electrical Characteristics(Tc=25°C) (unless otherwise specified)

Items	Symbols	Test Conditions		Min.	Typ.	Max.	Units
Drain-source breakdown voltage	$V_{(BR)DSS}$	I_D=1mA V_{GS}=0V		60			V
Gate threshold voltage	$V_{GS(th)}$	I_D=1mA $V_{DS}=V_{GS}$		1.0	1.5	2.0	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=60V V_{GS}=0V	T_{ch}=25°C			500	μA
			T_{ch}=125°C			1.0	mA
Gate-source leakage current	I_{GSS}	$V_{GS}=\pm16V$ V_{DS}=0V				10.0	μA
Drain-source on-state resistance	$R_{DS(on)}$	I_D=20A	V_{GS}=4V		30.0	50.0	mΩ
			V_{GS}=10V		20.0	30.0	mΩ
Forward transconductance	g_{fs}	I_D=20A V_{DS}=25V		13.0	25.0		S
Input capacitance	C_{iss}	V_{DS}=25V V_{GS}=0V f=1MHz			1600	2400	pF
Output capacitance	C_{oss}				580	870	
Reverse transfer capacitance	C_{rss}				320	480	
Turn-on time t_{on} ($t_{on}=t_{d(on)}+t_r$)	$td_{(on)}$	V_{CC}=30V I_D=40A V_{GS}=10V R_{GS}=25Ω			15	23	ns
	t_r				90	140	
Turn-off time t_{off} ($t_{off}=t_{d(off)}+t_f$)	$td_{(off)}$				300	450	
	t_f				190	290	
Avalanche capability	I_{AV}	L=100μH T_{ch}=25°C		40.0			A
Continuous reverse drain current	I_{DR}	T_c=25°C				40.0	A
Pulsed reverse drain current	I_{DRM}	T_c=25°C				160.0	A
Diode forward on-voltage	V_{SD}	$I_F=2\times I_{DR}$ V_{GS}=0V T_{ch}=25°C			1.40		V
Reverse recovery time	t_{rr}	$I_F=I_{DR}$ V_{GS}=0V			80.0		ns
Reverse recovery charge	Q_{rr}	$-dI_F/d_t$=100A/μs T_{ch}=25°C			0.17		μC

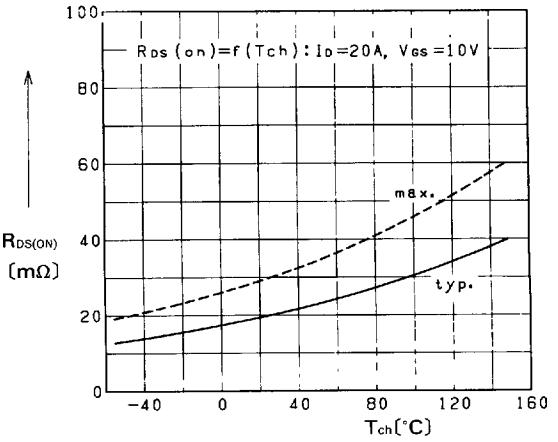
●Thermal Characteristics

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	$R_{th(ch-a)}$	channel to air			62.5	°C/W
	$R_{th(ch-c)}$	channel to case			3.125	°C/W

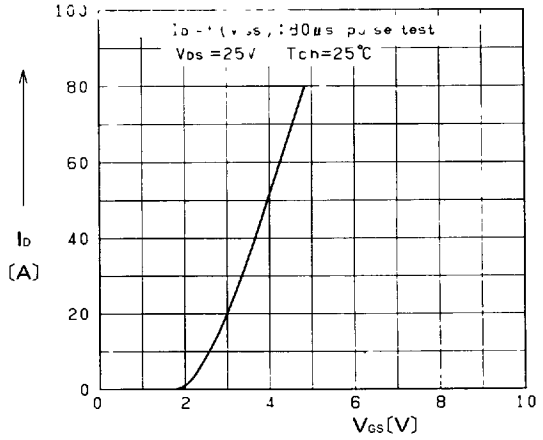
■ Characteristics



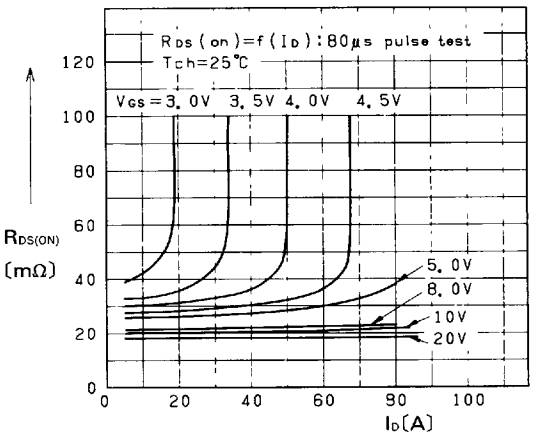
Typical Output Characteristics



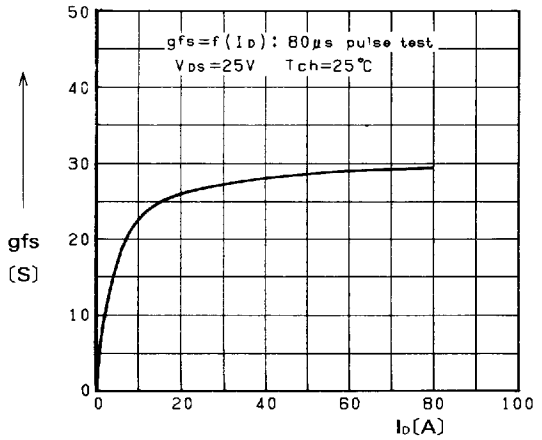
On-State Resistance vs. Tch



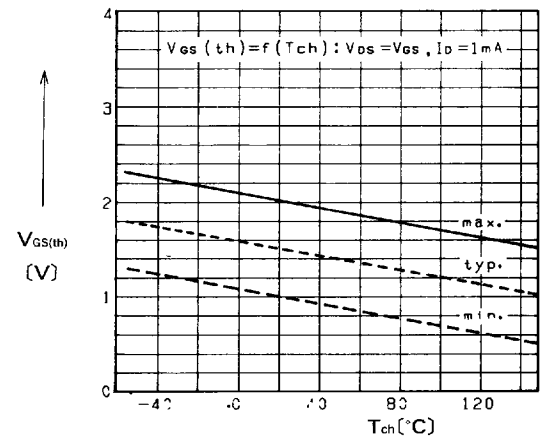
Typical Transfer Characteristics



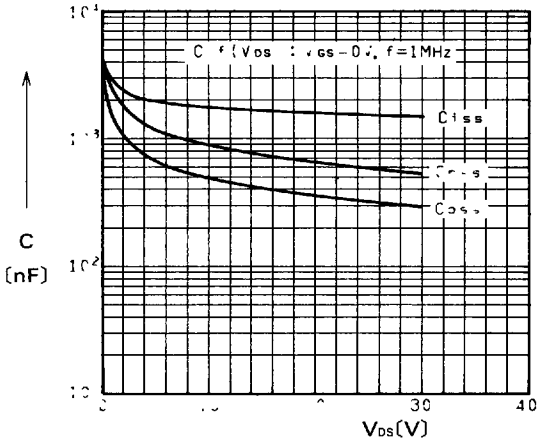
Typical Drain-Source on-State Resistance vs. ID



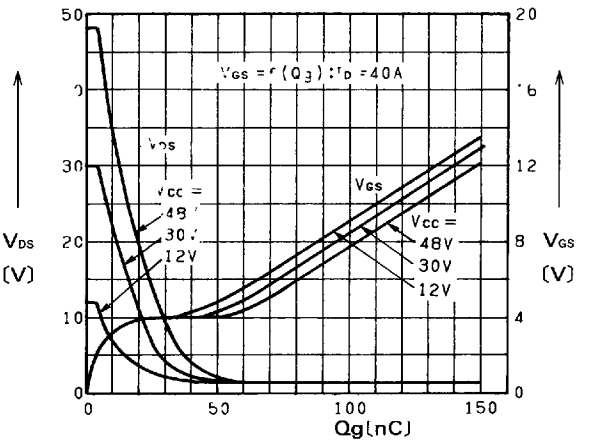
Typical Forward Transconductance vs. ID



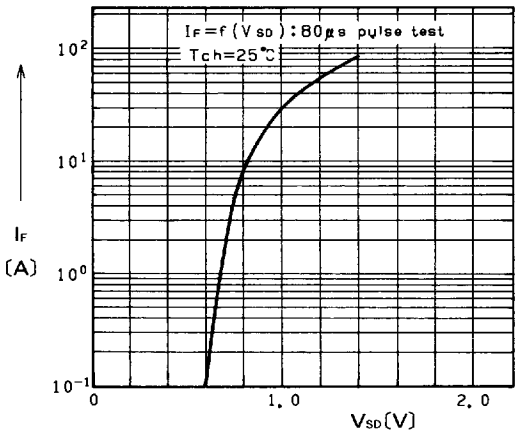
Gate Threshold Voltage vs. Tch



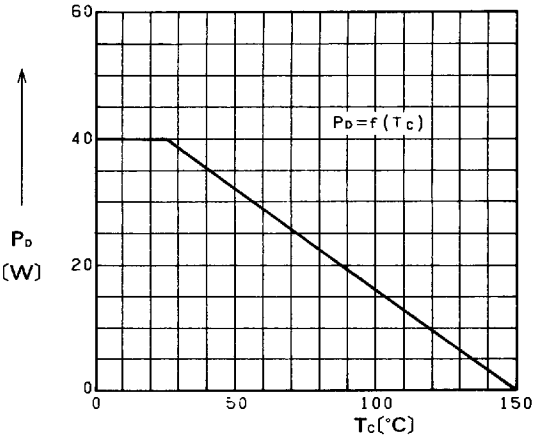
Typical Capacitance vs. V_{DS}



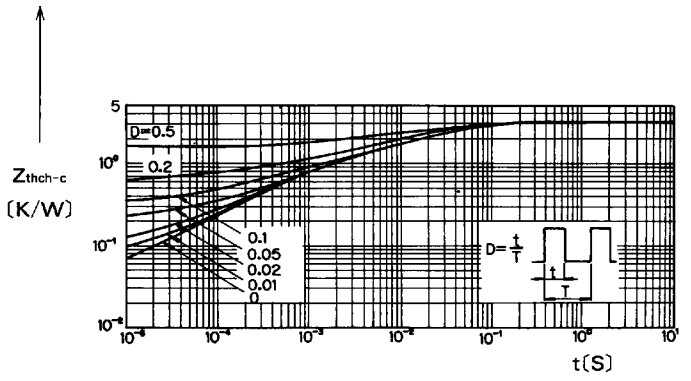
Typical Input Charge



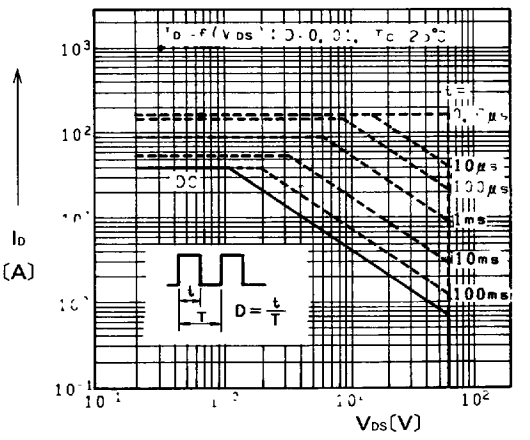
Forward Characteristics of Reverse Diode



Allowable Power Dissipation vs. T_c



Transient Thermal Impedance



Safe Operating Area