2SK1946-01MR

FUJI POWER MOS-FET

N-CHANNEL SILICON POWER MOS-FET

FAP-III SERIES

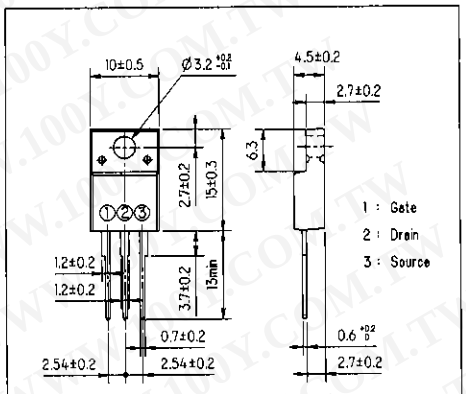
■ Features

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

■ Applications

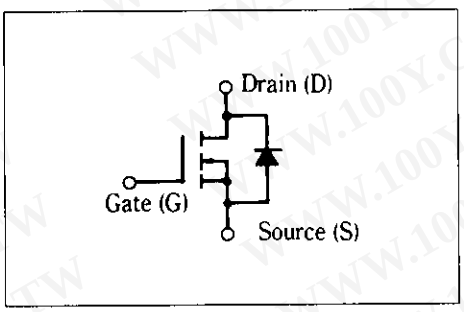
- Motor controllers
- General purpose power amplifier
- DC-DC converters

■ Outline Drawings



JEDEC	———
EIAJ	SC-67

■ Equivalent Circuit Schematic



■ 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	45	A
Pulsed drain current	$I_{D(puls)}$	180	A
Gate-source voltage	V_{GS}	±20	V
Max. power dissipation	P_D	50	W
Operating and storage temperature range	T_{ch}	150	°C
	T_{stg}	−55~+150	°C

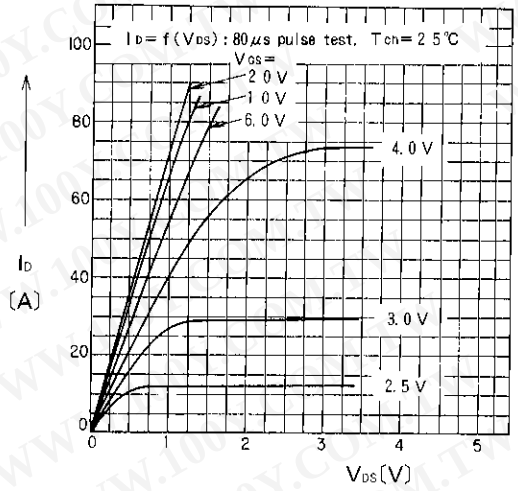
●Electrical Characteristics(Tc=25°C) (unless otherwise specified)

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	2.5	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=60V V_{GS}=0V	T_{ch}=25°C		10	500	μA
			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=22.5A	V_{GS}=4V		0.024	0.035	Ω
			V_{GS}=10V		0.015	0.022	Ω
Forward transconductance	g_{fs}	I_D=22.5A V_{DS}=25V		15	30		S
Input capacitance	C_{iss}	V_{DS}=25V V_{GS}=0V f=1MHz			2100	3150	pF
Output capacitance	C_{oss}				860	1290	
Reverse transfer capacitance	C_{rss}				490	740	
Turn-on time t_{on} (t_{on}=$t_{d(on)}$+t_r)	$t_{d(on)}$	V_{CC}=30V I_D=45A V_{GS}=10V R_{GS}=25Ω			30	45	ns
	t_r				200	300	
Turn-off time t_{off} (t_{off}=$t_{d(off)}$+t_f)	$t_{d(off)}$				500	750	
	t_f				400	600	
Avalanche capability	I_{AV}	L=100μH T_{ch}=25°C		45			A
Continuous reverse drain current	I_{DR}					45	A
Pulsed reverse drain current	I_{DRM}					180	A
Diode forward on-voltage	V_{SD}	I_F=2×I_{DR} V_{GS}=0V T_{ch}=25°C			1.5	2.25	V
Reverse recovery time	t_{rr}	I_F=I_{DR} V_{GS}=0V -dI_F/d_t=100A/μs T_{ch}=25°C			100		ns
Reverse recovery charge	Q_{rr}				0.5		μC

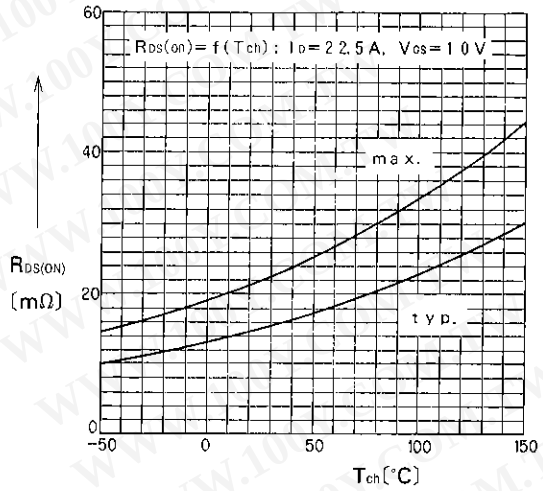
●Thermal Characteristics

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			2.5	°C/W

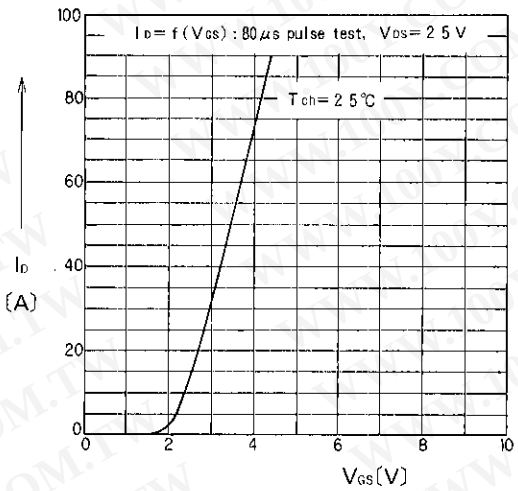
■ Characteristics



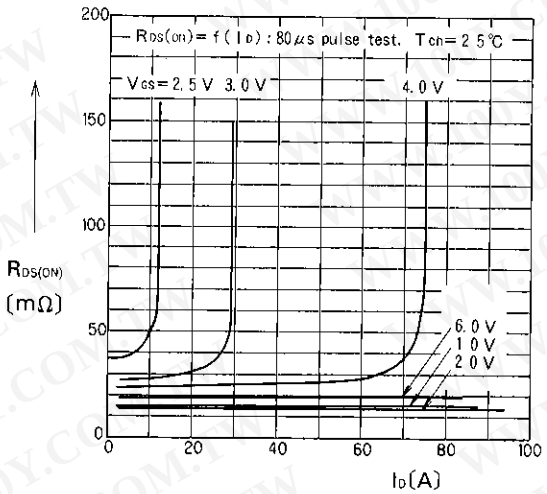
Typical Output Characteristics



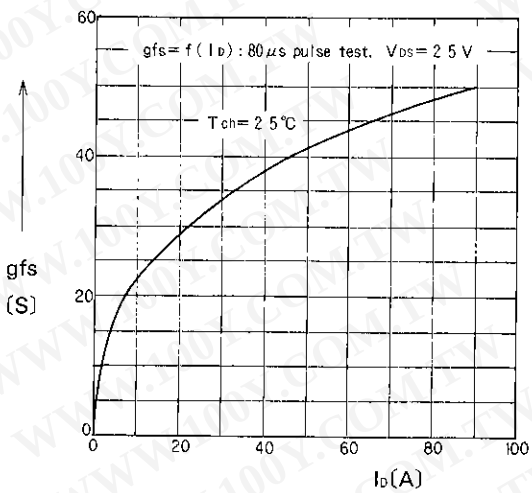
Drain-Source on-State Resistance vs. Tch



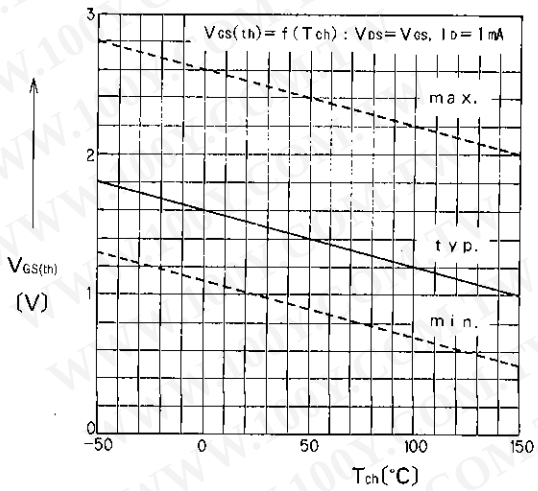
Typical Transfer Characteristics



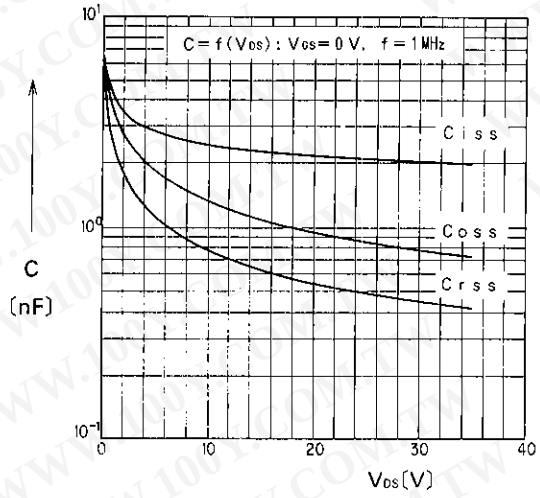
Typical Drain-Source on-State Resistance vs. ID



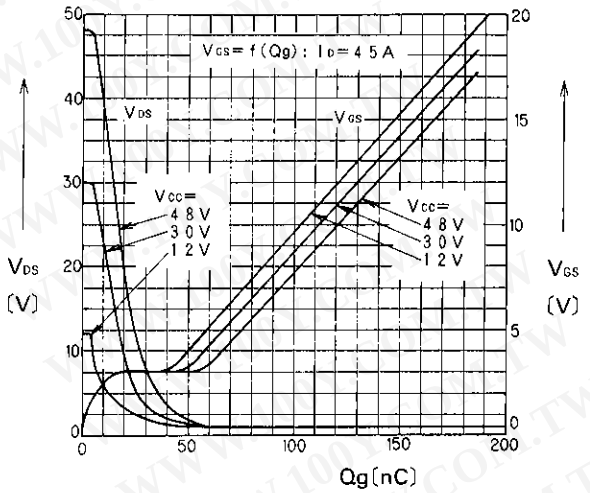
Typical Forward Transconductance vs. ID



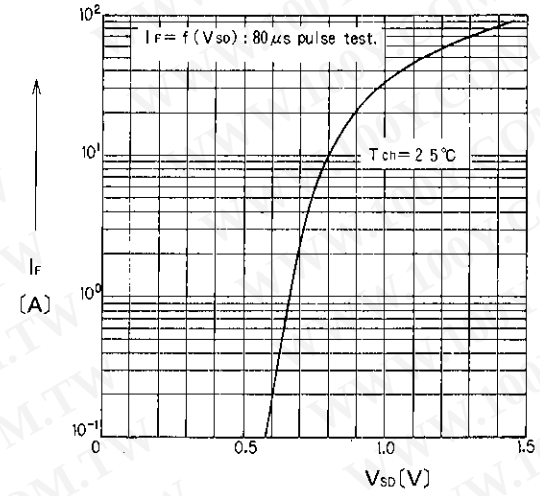
Gate Threshold Voltage vs. Tch



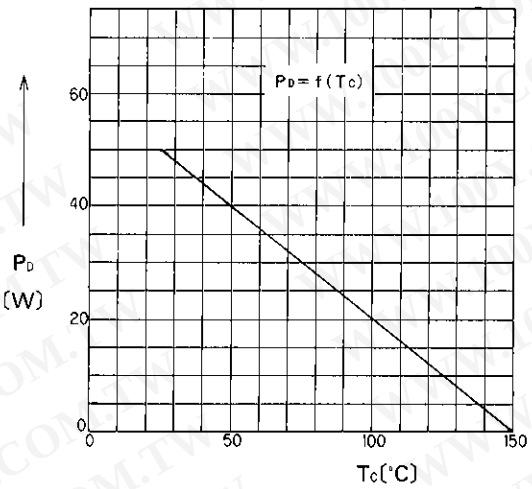
Typical Capacitances vs. V_{DS}



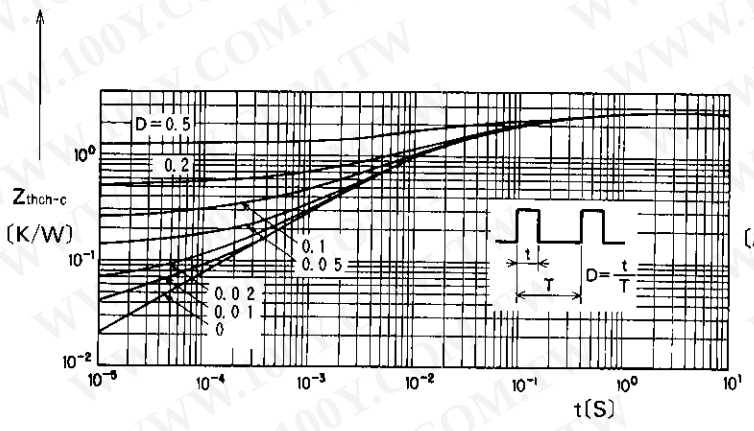
Typical Input Charge



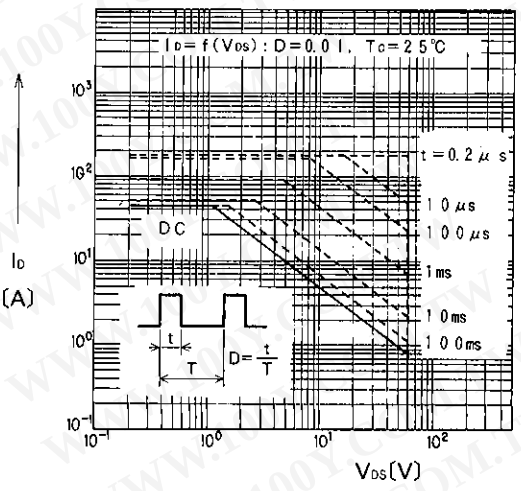
Forward Characteristics of Reverse Diode



Power Dissipation vs. T_C



Transient Thermal Impedance



Safe Operating Area