

# 2MI50F-050 SIPMOS® FUJI POWER MOS-FET

N-CHANNEL SILICON POWER MOS-FET

## MOS-FET MODULE

### Features

- Low on-resistance
- High current
- Insulated to elements and metal base
- Separated two-elements
- Include fast recovery diode

### Applications

- Inverters
- UPS
- A. C servo motors
- High frequency power supplies

### Max. Ratings and Characteristics

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

Items	Symbols	Ratings	Units
Drain-source voltage	$V_{DSS}$	500	V
Continuous drain current   Duty=66%	$I_D$	50	A
Pulsed drain current	$I_{D(puls)}$	150	A
Continuous reverse drain current	$I_{DR}$	50	A
Gate-source peak voltage	$V_{GSS}$	$\pm 20$	V
Max. power dissipation	$P_D$	400	W
Operating and storage temperature range	$T_{ch}$		°C
	$T_{stg}$	-40 ~ +125	°C
Isolation test voltage	AC Imin $V_{iso}$	2500	V

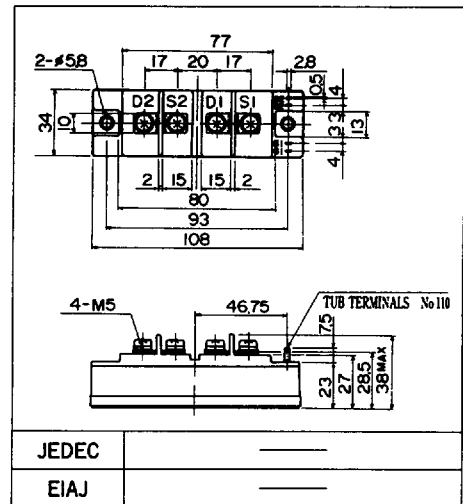
#### Electrical Characteristics(Tc=25°C)

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V$ $I_D=1mA$	500			V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=10mA$	2.1	3.0	4.0	V
Zero gate voltage drain current	$I_{DSS}$	$V_{GS}=0V$ $V_{DS}=500V$ $T_{ch}=25^\circ C$			1.0	mA
Gate-source leakage current	$I_{GSS}$	$V_{DS}=0V$ $V_{GS}=\pm 20V$			100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=15V$ $I_D=25A$			0.11	$\Omega$
Forward transconductance	$g_{fs}$	$V_{DS}=25V$ $I_D=25A$		45		S
Input capacitance	$C_{iss}$	$V_{GS}=0V$		7.8	13	nF
Output capacitance	$C_{oss}$	$V_{DS}=25V$		0.9	1.5	
Reverse transfer capacitance	$C_{rss}$	$f=1MHz$		0.4	0.6	
Switching time ( $t_{off}=t_{d(off)}+t_f$ )	$t_{on}$	$V_{CC}=100V$ $R_G=5\Omega$		530	750	ns
	$t_{d(off)}$	$I_D=25A$ $P_w=20\mu s$		700	1000	
	$t_f$	$V_{GS}=15V$		80	110	
Diode forward on-voltage	$V_{SD}$	$I_F=50A$ $V_{GS}=0V$		1.4	1.8	V
Reverse recovery time	$t_{rr}$	$I_F=50A$ $dI/dt=100A/\mu s$ $V_{GS}=0V$			150	ns

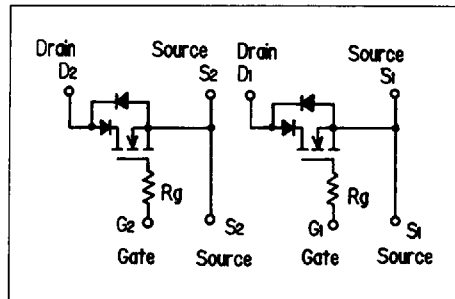
#### Thermal Characteristics

Items	Symbols	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance	$R_{th(c-f)}$	case to fim		0.06		°C/W
	$R_{th(ch-c)}$	channel to case			0.312	°C/W

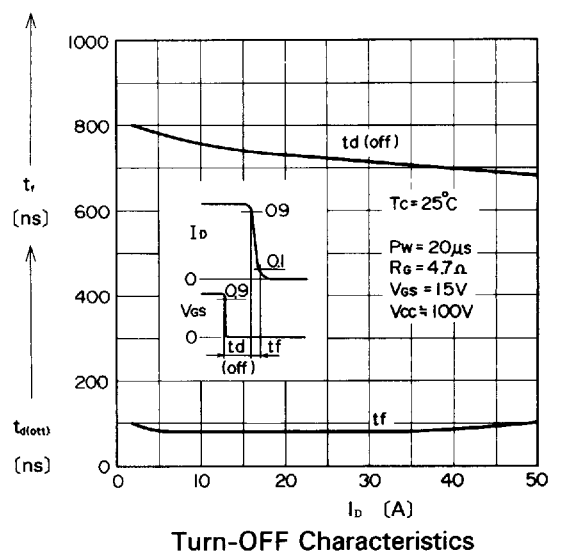
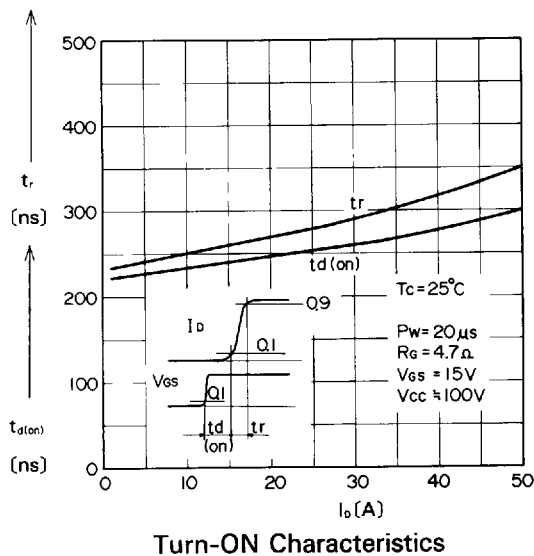
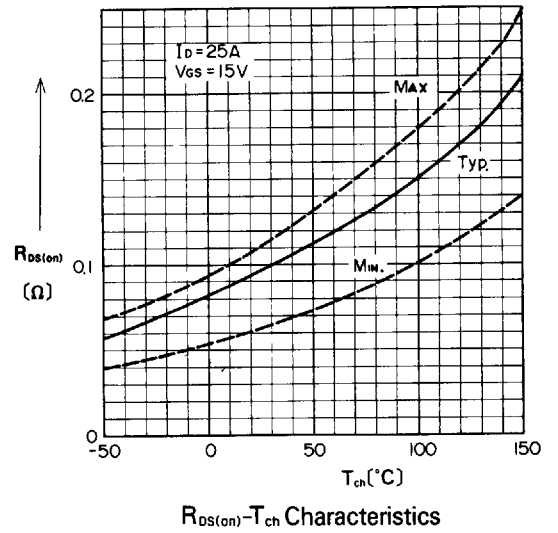
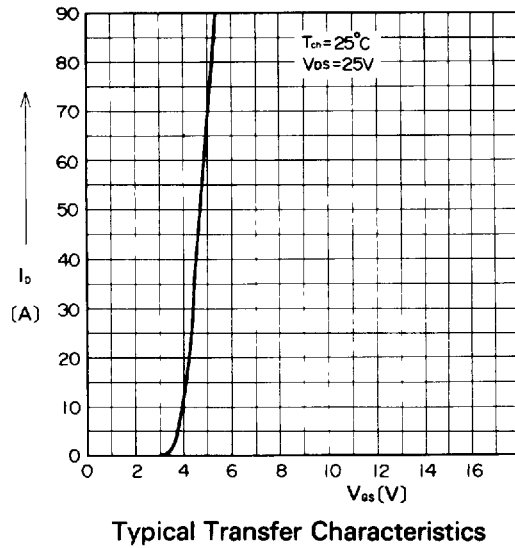
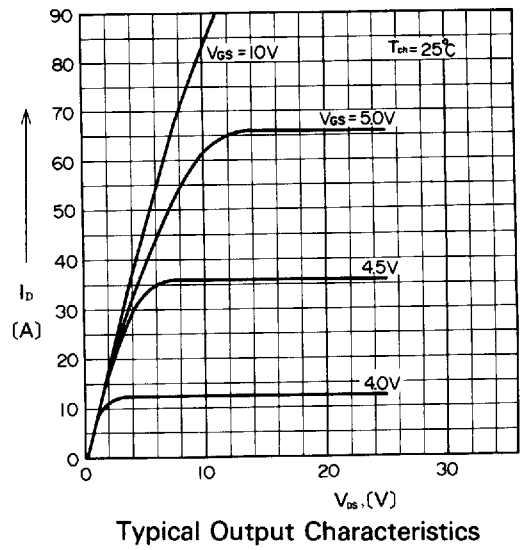
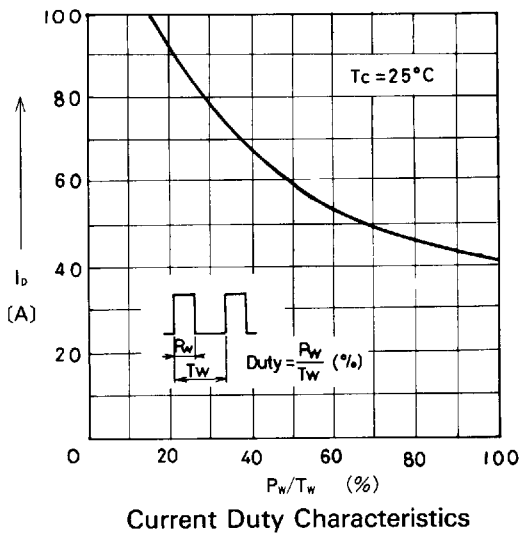
### Outline Drawings

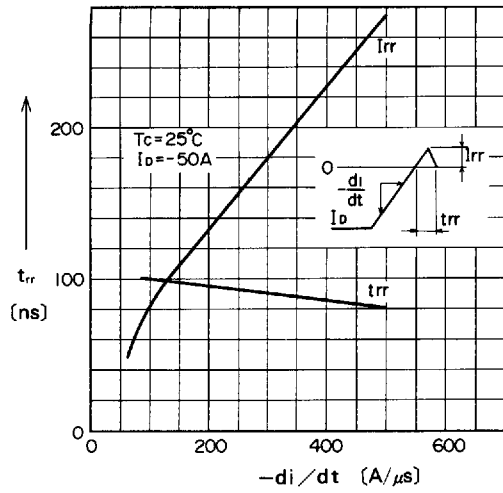


### Equivalent Circuit Schematic

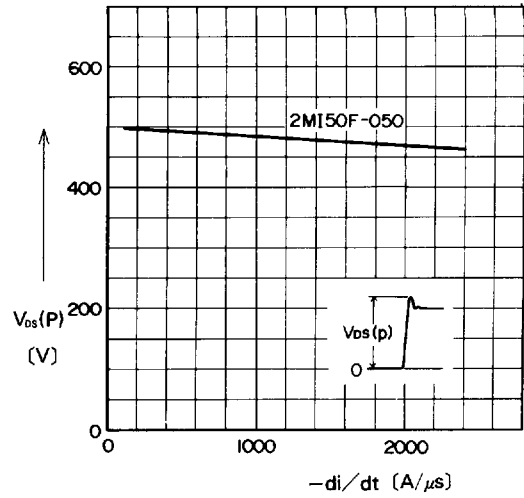


■ Characteristics

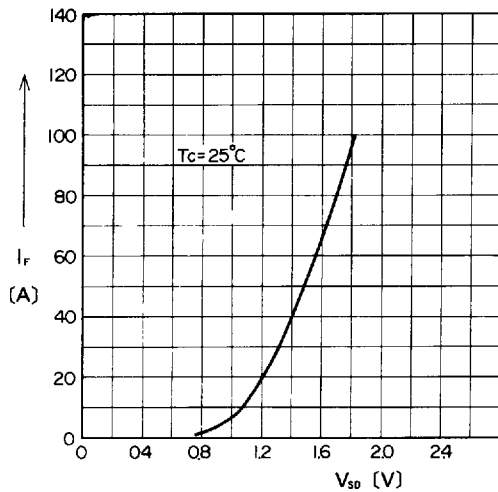




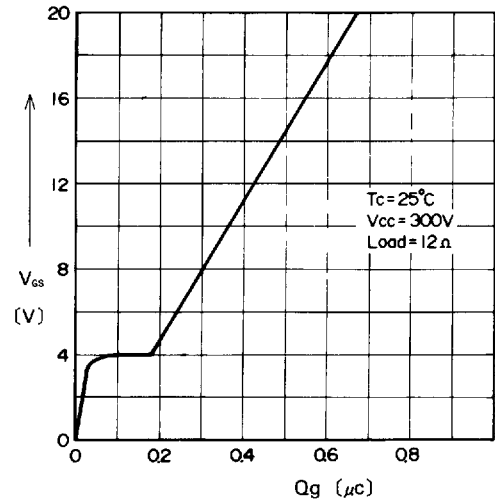
Reverse Recovery Characteristics



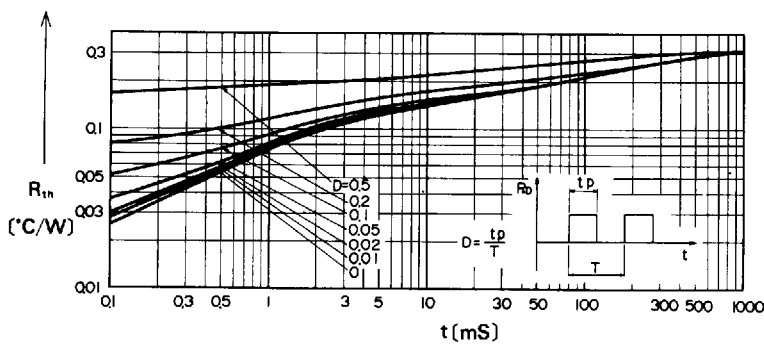
Max. Allowable  $di/dt$  at toff



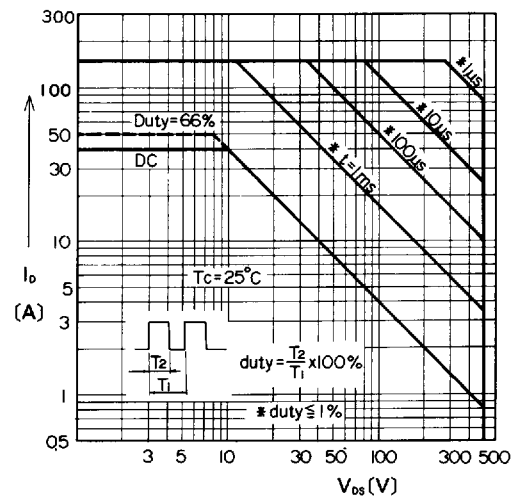
Forward Voltage of FWD



Typical Input Charge



Transient Thermal Impedance



Safe Operating Area