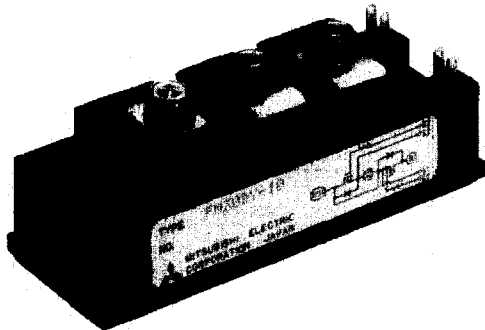


# FM30DY-9,-10

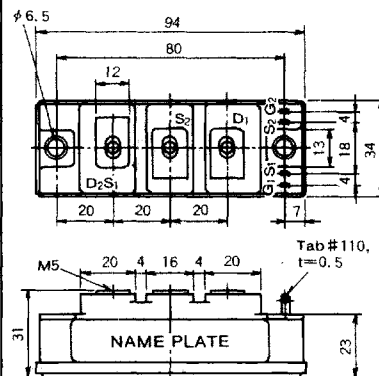
MEDIUM POWER SWITCHING USE  
INSULATED TYPE

FM30DY-9, -10

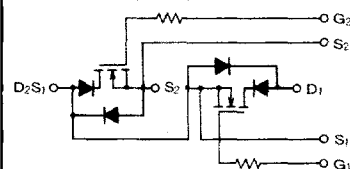


- $I_D$  ..... 30A
- $V_{DSS}$  ..... 450/500V
- Insulated Type
- UL Recognized      Yellow Card No. ; E80276( N )  
File No. ; E80271

OUTLINE DRAWING      Dimensions in mm



CIRCUIT DIAGRAM



## APPLICATION

AC & DC Motor Controls, General Purpose Inverters, UPS, CVCF, Welders, Servo Controls, NC, Robotics, Cutting Tools, Induction Heating, etc.

## ABSOLUTE MAXIMUM RATINGS ( $T_{ch}=25^{\circ}C$ )

Symbol	Parameter	Conditions	Voltage class		Unit
			-9	-10	
$V_{DSS}$	Drain-source voltage	G-S short	450	500	V
$V_{GSS}$	Gate-source voltage	D-S short	±20		V

Symbol	Parameter	Conditions	Ratings	Unit
$I_D$	Drain current	$T_C=25^{\circ}C$	30	A
$I_{DM}$		Pulse	(Note 2)	90
$I_S$ (Note 1)	Source current	$T_C=25^{\circ}C$	30	A
$I_{SM}$ (Note 1)		Pulse	(Note 2)	90
$P_D$	Maximum power dissipation	$T_C=25^{\circ}C$	250	W
$T_{ch}$	Channel temperature		-40~+150	$^{\circ}C$
$T_{stg}$	Storage temperature		-40~+125	$^{\circ}C$
$V_{isol}$	Isolation voltage	AC for 1 minute	2500	V
—	Mounting torque	Main terminals M5 screw	15~20	kg·cm
		Mounting M6 screw	20~30	kg·cm
—	Weight	Typical value	210	g

**ELECTRICAL CHARACTERISTICS** ( $T_{ch}=25^{\circ}C$ )

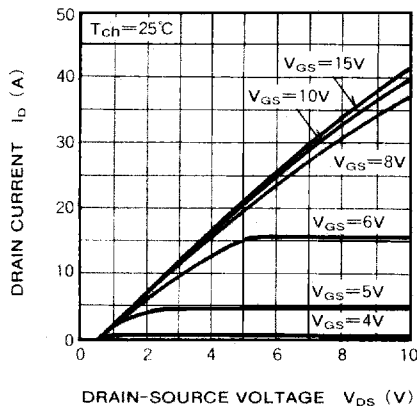
Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
$I_{DSS}$	Drain current, with gate short circuit to source	$V_{DS}=V_{DSS}, V_{GS}=0V$	—	—	1	mA
		$V_{DS}=0.8 \cdot V_{DSS}, V_{GS}=0V, T_{ch}=125^{\circ}C$	—	—	10	
$V_{GS(th)}$	Gate-source threshold voltage	$I_D=1mA, V_{DS}=10V$	2	3	4	V
$\pm I_{GSS}$	Gate leakage current	$\pm V_{GS}=V_{GSS}, V_{DS}=0V$	—	—	0.3	$\mu A$
$r_{DS(on)}$	Static drain-source on-state resistance	$T_{ch}=25^{\circ}C$	—	—	0.3	$\Omega$
		$T_{ch}=150^{\circ}C$	—	—	0.6	
$V_{DS(on)}$	Static drain-source on-state voltage	$T_{ch}=25^{\circ}C$	—	—	9	V
		$T_{ch}=150^{\circ}C$	—	—	18	
$ y_{fs} $	Forward transfer admittance	$I_D=15A, V_{DS}=10V$ (Note 3)	10	—	—	S
$C_{iss}$	Input capacitance	$V_{GS}=0V$	—	—	6000	pF
$C_{oss}$	Output capacitance	$V_{DS}=10V$	—	—	1500	pF
$C_{rss}$	Reverse transfer capacitance	$f=1MHz$	—	—	600	pF
$Q_G$	Total gate charge	$V_{DD}=300V, I_D=30A, V_{GS}=15V$	—	360	—	nC
$t_{on}$	Turn-on time	$V_{DD}=300V, I_D=15A, V_{GS}=+15V$	—	—	400	ns
$t_{off}$	Turn-off time	$R_{GEN}=R_{GS}=50\Omega$	—	—	900	ns
$t_{on}$	Turn-on time	$V_{DD}=300V, I_D=30A, V_{GS}=+10V$	—	170	—	ns
$t_{off}$	Turn-off time	$R_{G1}=R_{G2}=4.7\Omega$	—	150	—	ns
$V_{SD}$ (Note 1)	Source-drain voltage	$I_S=30A, V_{GS}=0V$	—	—	2.5	V
$t_{rr}$ (Note 1)	Reverse recovery time	$I_S=30A, V_{GS}=0V$	—	120	200	ns
$Q_{rr}$	Reverse recovery charge	$dis/dt=-60A/\mu s$	—	410	—	$\mu C$
$R_{th(ch-c)}$	Thermal resistance	MOSFET part, per a half module	—	—	0.5	$^{\circ}C/W$
$R_{th(j-c)}$		Diode part, per a half module	—	—	1.3	$^{\circ}C/W$
$R_{th(c-f)}$	Contact thermal resistance	Conductive grease applied, per a half module	—	—	0.15	$^{\circ}C/W$

Note 1.  $I_S, V_{SD}$  &  $dis/dt$  represent characteristics of the anti-parallel, source to drain free-wheel diode of the MOSFET.

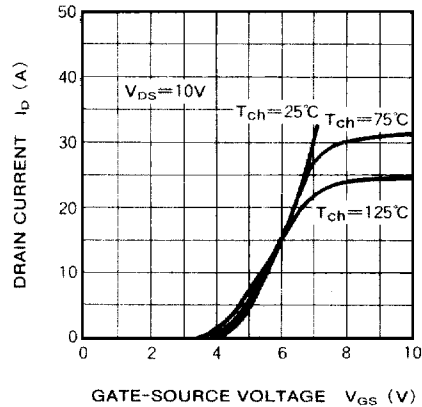
2. Pulse width and repetition rate should be such that the device channel temp. ( $T_{ch}$ ) does not exceed  $T_{chmax}$  rating.
3. Pulse width and repetition rate should be such as to cause negligible temperature rise.

**PERFORMANCE CURVES**

**OUTPUT CHARACTERISTICS**  
(TYPICAL)

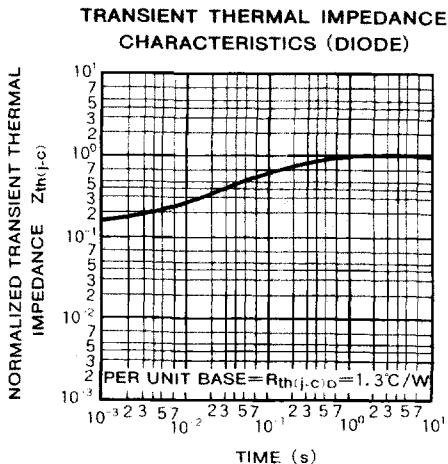
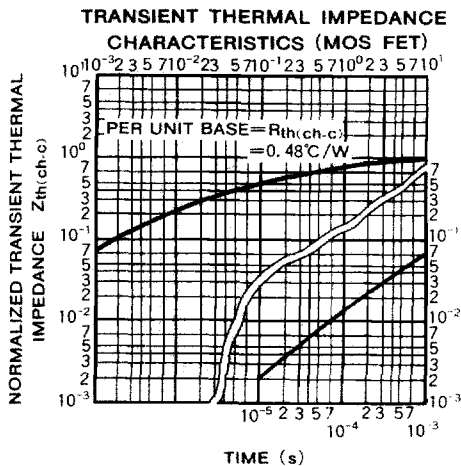
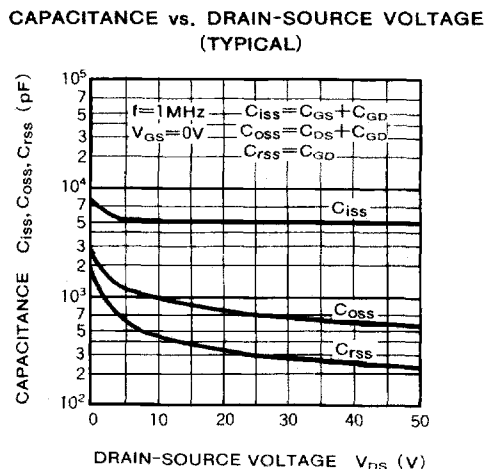
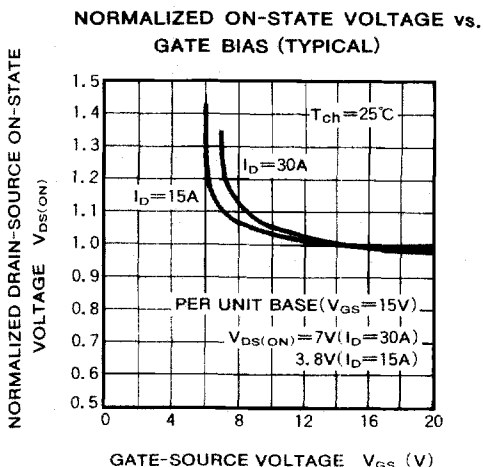
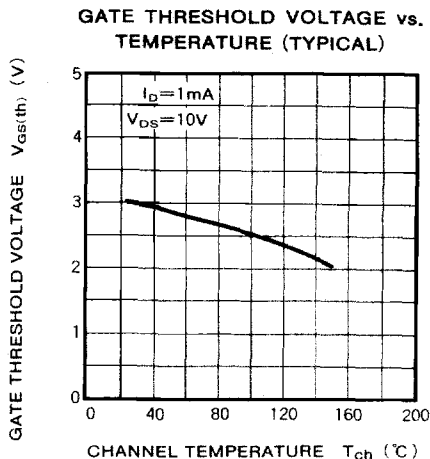
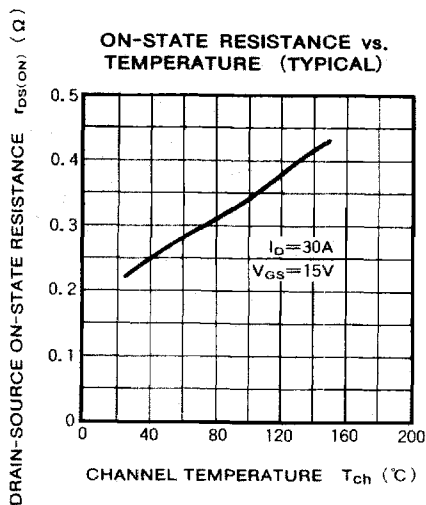


**TRANSFER CHARACTERISTICS**  
(TYPICAL)



# FM30DY-9,-10

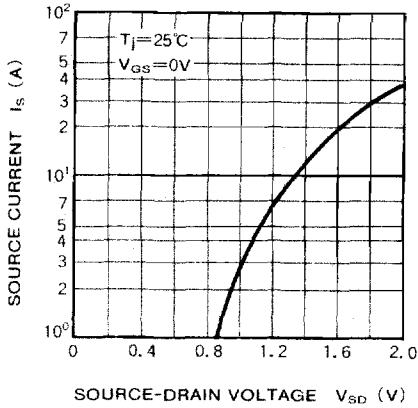
MEDIUM POWER SWITCHING USE  
INSULATED TYPE



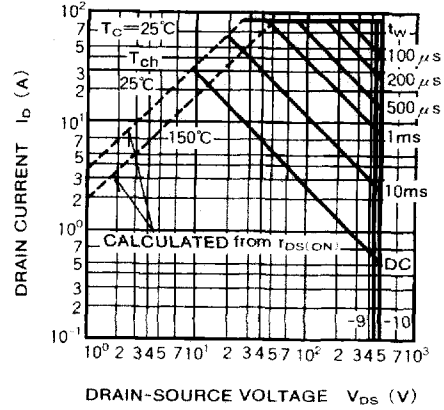
# MITSUBISHI MOSFET MODULES FM30DY-9,-10

## MEDIUM POWER SWITCHING USE INSULATED TYPE

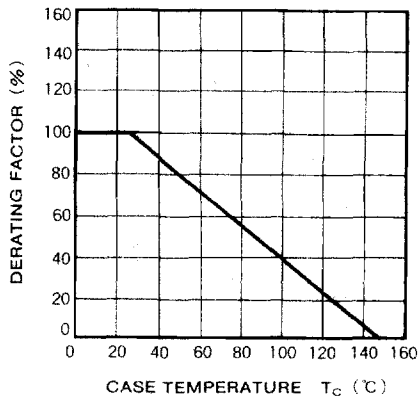
FREE-WHEEL DIODE FORWARD CHARACTERISTICS (TYPICAL)



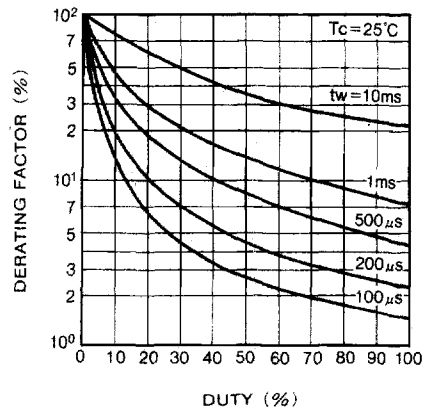
FORWARD BIAS SAFE OPERATING AREA



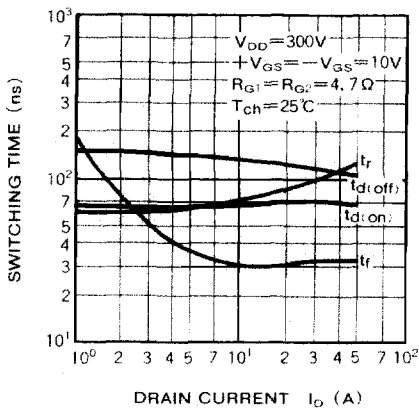
DERATING FACTOR OF S. O. A



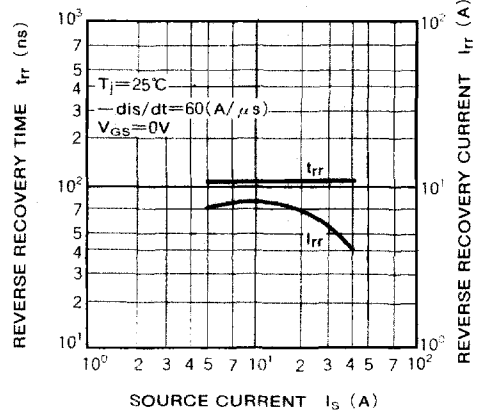
DERATING FACTOR OF S. O. A



SWITCHING CHARACTERISTICS (TYPICAL)



REVERSE RECOVERY CHARACTERISTICS (TYPICAL)



# FM30DY-9,-10

MEDIUM POWER SWITCHING USE  
INSULATED TYPE

