HITACHI

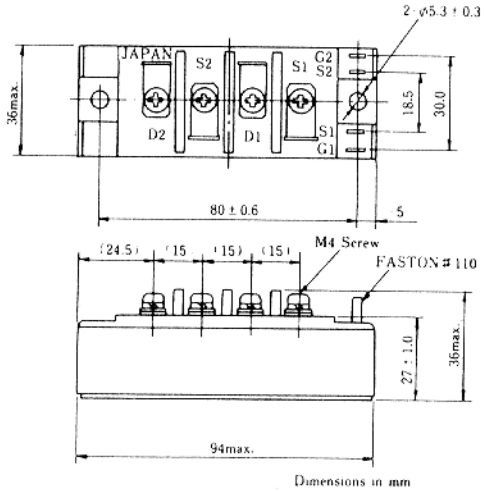
PM50302F

SILICON N-CHANNEL POWER MOS FET MODULE

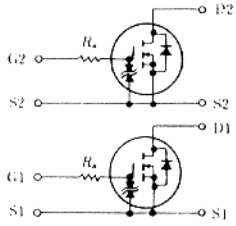
HIGH SPEED POWER SWITCHING

■ FEATURES

- Equipped with Power MOS FET
- Low On-Resistance
- High Speed Switching
- Low Drive Current
- Wide Area of Safe Operation
- Inherent Parallel Diod between Source and Drain
- Isolated Base from Terminal
- Suitable for Motor Driver, Switching Regulator and etc.



Dimensions in mm



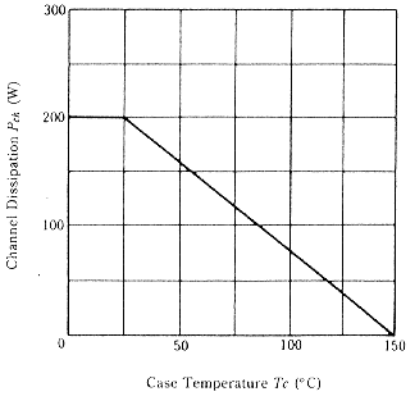
Symbol	Electrode	Terminals	Remarks
S1	Source 1	M4 Screw	Power terminals
D1	Drain 1	M4 Screw	Power terminals
S2	Source 2	M4 Screw	Power terminals
D2	Drain 2	M4 Screw	Power terminals
G1	Gate 1	#110	Signal terminals
S1	Source 1	#110	Signal terminals
G2	Gate 2	#110	Signal terminals
S2	Source 2	#110	Signal terminals

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C) (Per FET Chip)

Item	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	500	V
Gate-Source Voltage	V_{GSS}	±20	V
Drain Current	I_D	30	A
Drain Peak Current	$I_{D\ peak}$	60	A
Body-Drain Diode Reverse Drain Current	I_{DR}	30	A
Body-Drain Diode Reverse Drain Peak Current	$I_{DR\ peak}$	60	A
Channel Dissipation	P_ch*	200	W
Channel Temperature	T_ch	150	°C
Storage Temperature	T_{stg}	−45 ~ +125	°C
Insulation Dielectric	V_{iso}**	2000	V

*Value at Tc = 25°C **Base to Terminals AC minute

POWER VS. TEMPERATURE DERATING



■ ELECTRICAL CHARACTERISTICS (Ta=25℃) (Per FET chip)

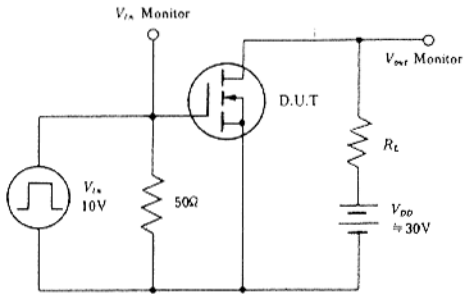
Item	Symbol	Test Condition	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=10mA, V_{GS}=0	500	—	—	V
Gate-Source Leak Current	I_{GSS}	V_{GS}=±16V, V_{DS}=0	—	—	±50	μA
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	I_G=±100μA, V_{DS}=0	±20	—	—	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=400V, V_{GS}=0	—	—	1	mA
Gate-Source Threshold Voltage	$V_{GS(th)}$	I_D=1mA, V_{DS}=10V	1.5	—	4.0	V
Drain-Source Saturation Voltage	$V_{DS(on)}$	I_D=15A, V_{GS}=10V*	—	2.25	3.0	V
Static Drain-Source On State Resistance	$R_{DS(on)}$	I_D=15A, V_{GS}=10V*	—	0.15	0.20	Ω
Forward Transfer Admittance	$\|y_{fs}\|$	I_D=15A, V_{DS}=10V*	15	25	—	S
Input Capacitance	C_{iss}	V_{DS}=10V, V_{GS}=0, f=1MHz	—	6150	—	pF
Output Capacitance	C_{oss}		—	2160	—	pF
Reverse Transfer Capacitance	C_{rss}		—	240	—	pF
Turn-on Delay Time	$t_{d(on)}$	I_D=15A, V_{GS}=10V, R_L=2Ω	—	100	—	ns
Rise Time	t_r		—	480	—	ns
Turn-off Delay Time	$t_{d(off)}$		—	500	—	ns
Fall Time	t_f		—	400	—	ns
Body-Drain Diode Forward Voltage	V_{DF}	I_F=15A, V_{GS}=0	—	1.2	—	V
Body-Drain Diode Reverse Recovery Time	t_{rr}	I_F=15A, V_{GS}=0, di_F/dt=100A/μs	—	200	—	ns

*Pulse Test

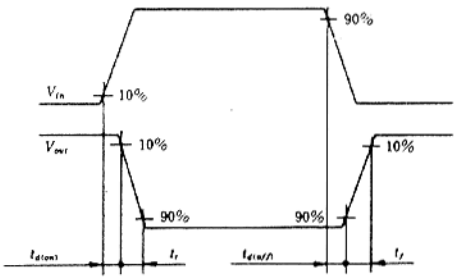
■ MECHANICAL CHRACTERISTICS

Item	Symbol	Condition	Rating	Unit
Fixing Strength	—	Mounted into main-terminal with M4 screw	15~20	kg · cm
	—	Mounted into heat sink with M5 screw	15~25	kg · cm
Weight	—	Typical value	220	g

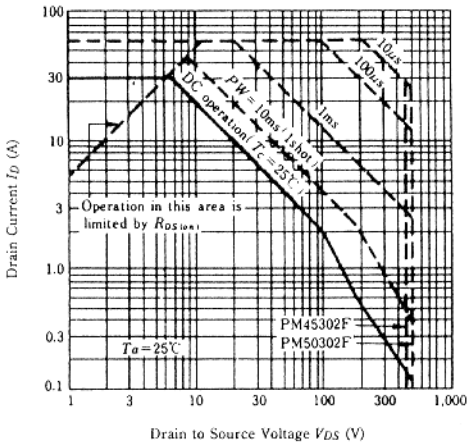
SWITCHING TIME TEST CIRCUIT



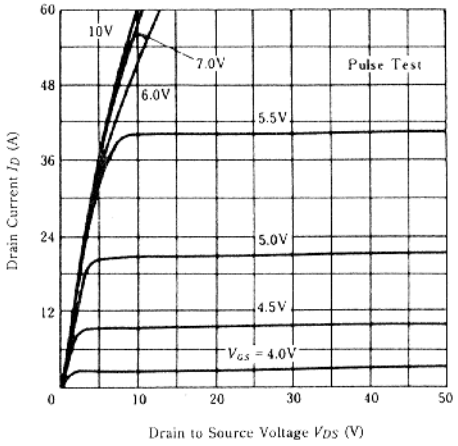
WAVEFORMS



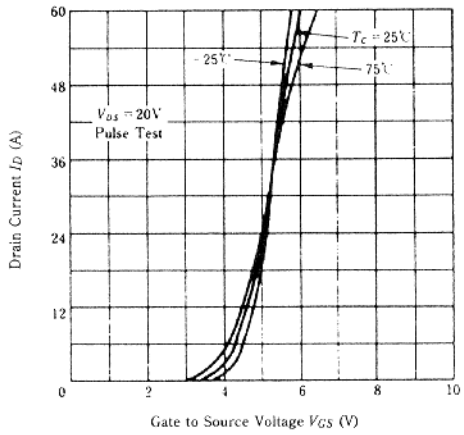
MAXIMUM SAFE OPERATION AREA



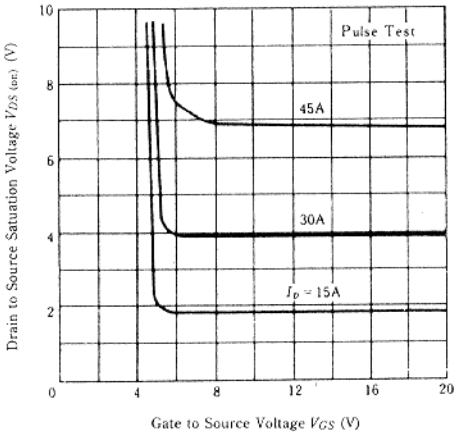
TYPICAL OUTPUT CHARACTERISTICS



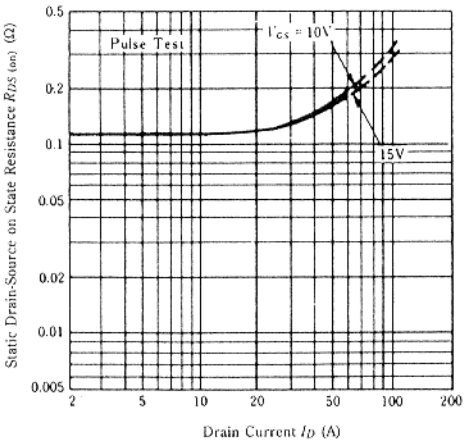
TYPICAL TRANSFER CHARACTERISTICS



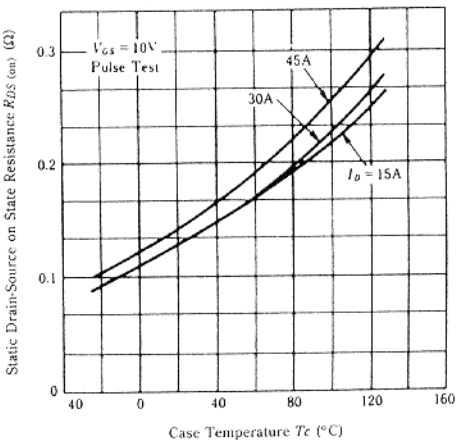
DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE



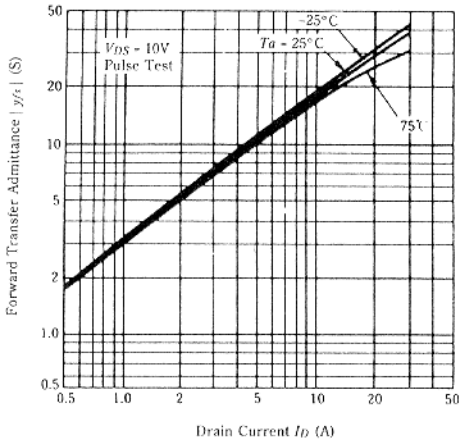
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. DRAIN CURRENT



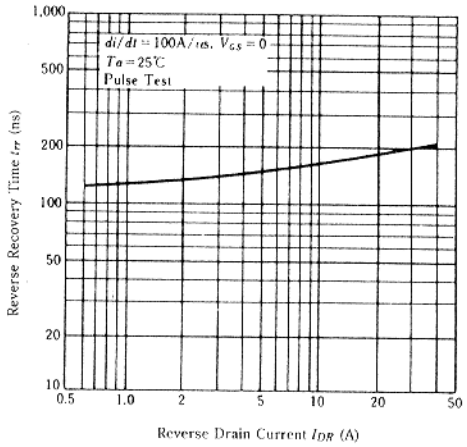
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. TEMPERATURE



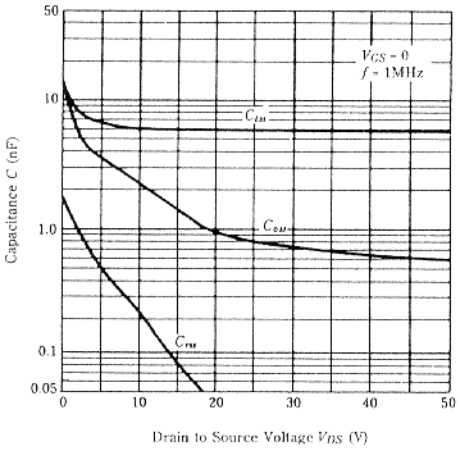
FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT



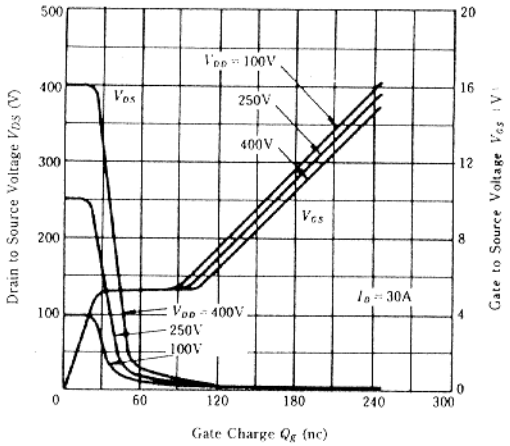
BODY-DRAIN DIODE REVERSE RECOVERY TIME



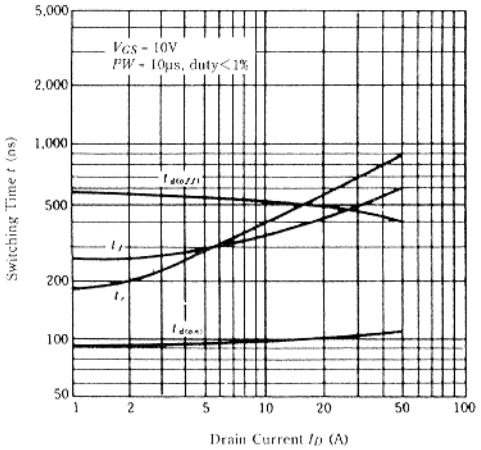
TYPICAL CAPACITANCE VS. DRAIN-SOURCE VOLTAGE



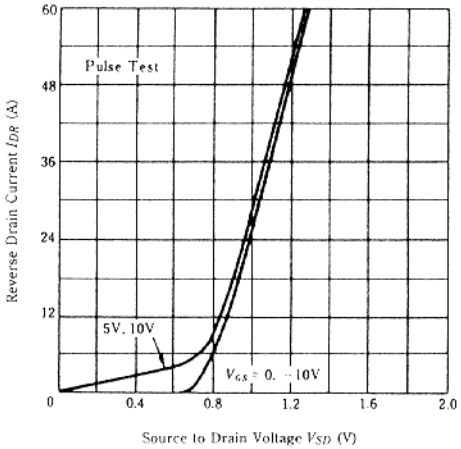
DYNAMIC INPUT CHARACTERISTICS



SWITCHING CHARACTERISTICS



REVERSE DRAIN CURRENT VS. SOURCE TO DRAIN VOLTAGE



NORMALIZED TRANSIENT THERMAL IMPEDANCE VS. PULSE WIDTH