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# PM4575J

Silicon N-Channel Power MOS FET Module

# HITACHI

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## Application

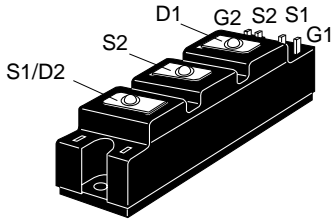
High Speed Power Switching

## Features

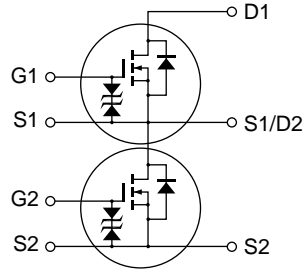
- Equipped with Power MOS FET
- Low on-resistance
- High speed switching
- Low drive current
- Wide area of safe operation
- Inherent parallel diode between source and drain
- Isolated base from Terminal
- Suitable for motor driver, switching regulator and etc.

## Outline

LF-J



Equivalent Circuit



No	Electrode	Terminals	Remarks
S1	Source 1	M5 screw	Power terminal
D1	Drain 1	M5 screw	
S2	Source 2	M5 screw	
D2	Drain 2	M5 screw	
G1	Gate 1	#110	Signal terminals
S1	Source 1	#110	
G2	Gate 2	#110	
S2	Source 2	#110	

## Absolute Maximum Ratings (Ta = 25°C) (Per FET chip)

Item	Symbol	Rating	Unit
Drain source voltage	$V_{(BR)DSS}$	450	V
Gate source voltage	$V_{(BR)GSS}$	±30	V
Drain current	$I_D$	75	A
Drain peak current	$I_{D(peak)}$	180	A
Body to drain diode reverse drain current	$I_{DR}$	75	A
Body to drain diode reverse peak current	$I_{DR(peak)}$	180	A
Channel dissipation	$P_{ch}^{*1}$	300	W
Channel temperature	$T_{ch}$	150	°C
Storage temperature	$T_{stg}$	-45 to +125	°C
Insulation dielectric	$V_{iso}^{*2}$	2000	Vrms

Notes: 1. Value at Ta = 25°C

2. Base to terminals AC minute

## Electrical Characteristics (Ta = 25°C) (Per FET chip)

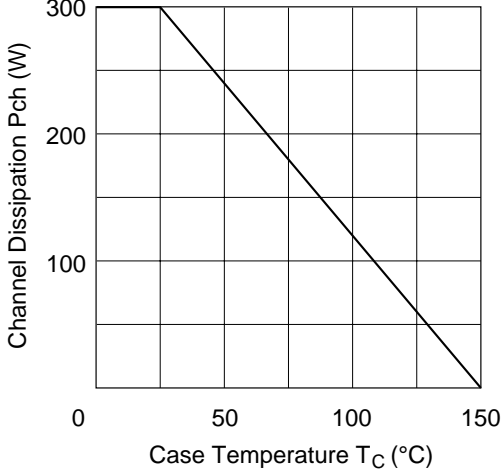
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	450	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0 \text{ V}$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 25 \text{ V}$ , $V_{DS} = 0 \text{ V}$
Gate to source breakdown voltage	$V_{(BR)GSS}$	$\pm 30$	—	—	V	$I_G = \pm 100 \mu\text{A}$ , $V_{DS} = 0 \text{ V}$
Drain leak current	$I_{DSS}$	—	—	500	$\mu\text{A}$	$V_{DS} = 360 \text{ V}$ , $V_{GS} = 0 \text{ V}$
Gate to source threshold voltage	$V_{GS(th)}$	2.0	—	3.0	V	$I_D = 1 \text{ mA}$ , $V_{DS} = 10 \text{ V}$
Drain to source saturation voltage	$V_{DS(on)}$	—	3.7	4.44	V	$I_D = 37 \text{ A}$ , $V_{GS} = 10 \text{ V}^{*1}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.10	0.12	$\Omega$	$I_D = 37 \text{ A}$ , $V_{GS} = 10 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	—	45	—	S	$I_D = 37 \text{ A}$ , $V_{DS} = 10 \text{ V}^{*1}$
Input capacitance	$C_{iss}$	—	9600	—	$\mu\text{F}$	$V_{DS} = 10 \text{ V}$ , $V_{GS} = 0 \text{ V}$
Output capacitance	$C_{oss}$	—	2300	—		$f = 1 \text{ MHz}$
Reverse transfer capacitance	$C_{rss}$	—	330	—		
Turn-on delay time	$t_{d(on)}$	—	100	—	ns	$I_D = 37 \text{ A}$ , $V_{GS} = 10 \text{ V}$
Rise time	$t_r$	—	310	—		$R_g = 50 \Omega$
Turn-off delay time	$t_{d(off)}$	—	550	—		$R_L = 1 \Omega$
Fall time	$t_f$	—	135	—		
Body to drain diode forward voltage	$V_{DF}$	—	1.8	—	V	$I_F = 75 \text{ A}$ , $V_{GS} = 0 \text{ V}$
Body to drain diode reverse recovery time	$t_{rr}$	—	130	—	ns	$I_F = 75 \text{ A}$ , $V_{GS} = 0 \text{ V}$ $di/dt = 100 \text{ A/ms}$

Note: 1. Pulse Test

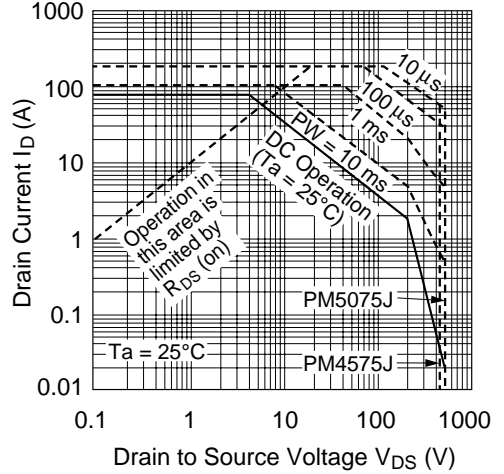
## Mechanical Characteristics

Item	Symbol	Condition	Rating	Unit
Fixing strength	—	Mounting into main-terminal with M4 screw	1.45 to 1.95	N-m
	—	Mounting into heat sink with M5 screw	1.95 to 2.9	N-m
Weight	—	Typical value	200	g

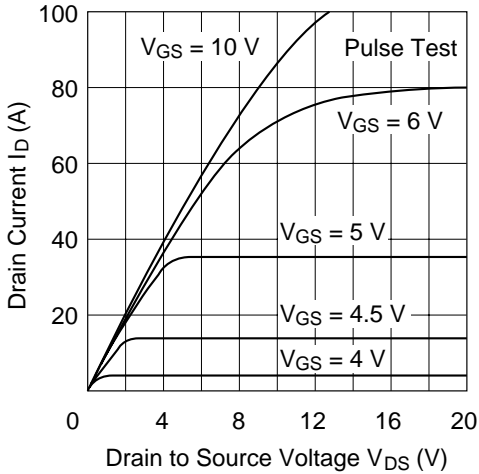
Power vs. Temperature Derating



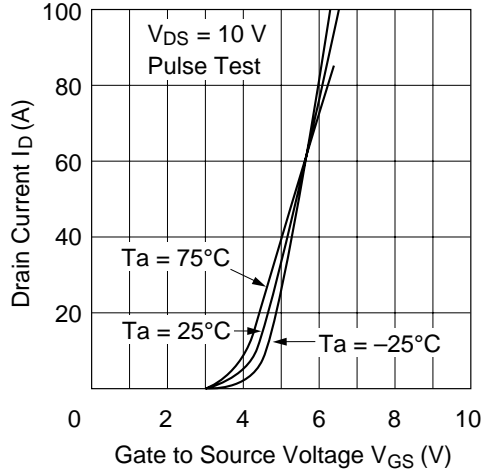
Maximum Safe Operation Area

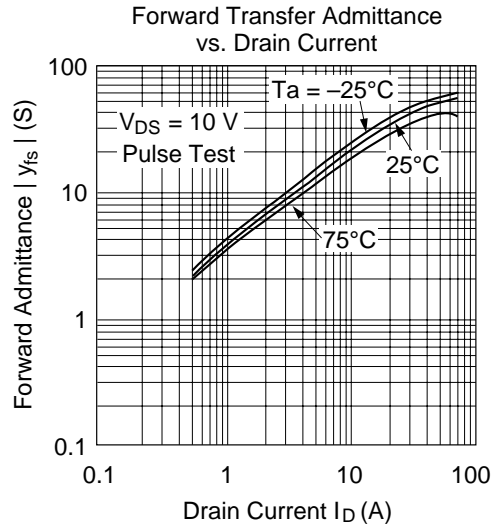
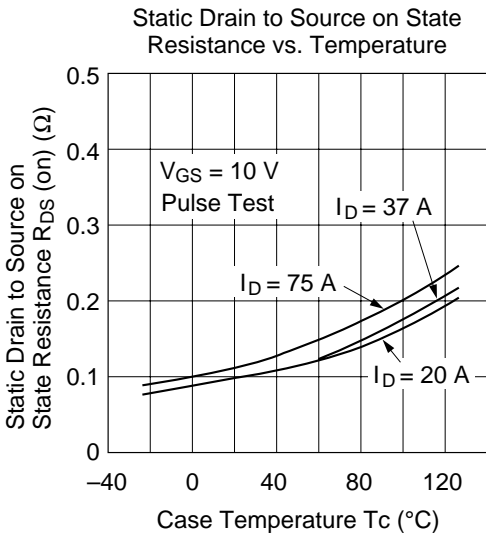
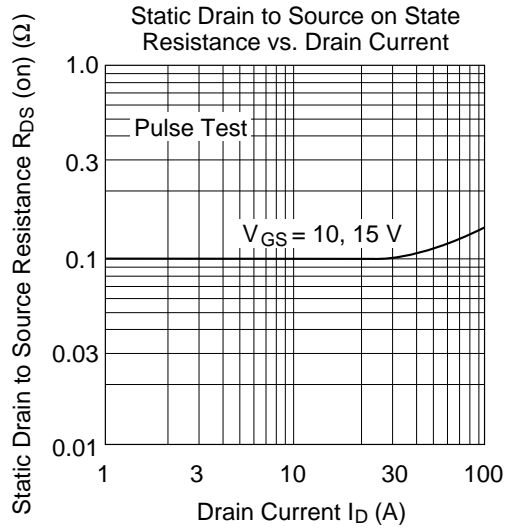
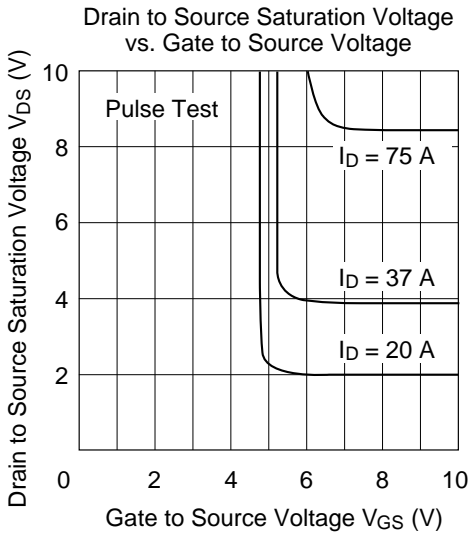


Typical Output Characteristics

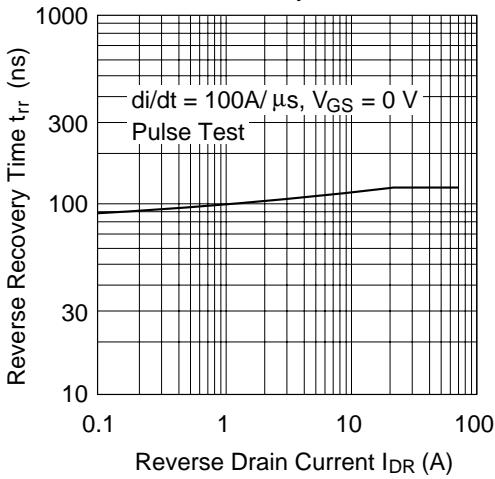


Typical Transfer Characteristics

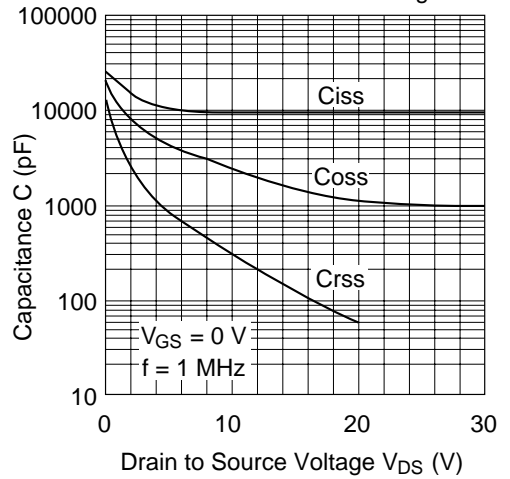




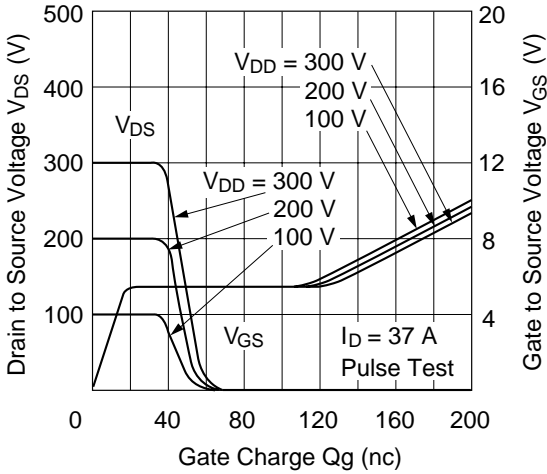
Body to Drain Diode Reverse Recovery Time



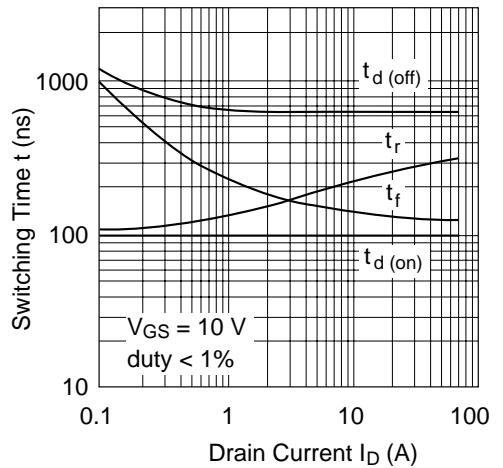
Typical Capacitance vs. Drain to Source Voltage

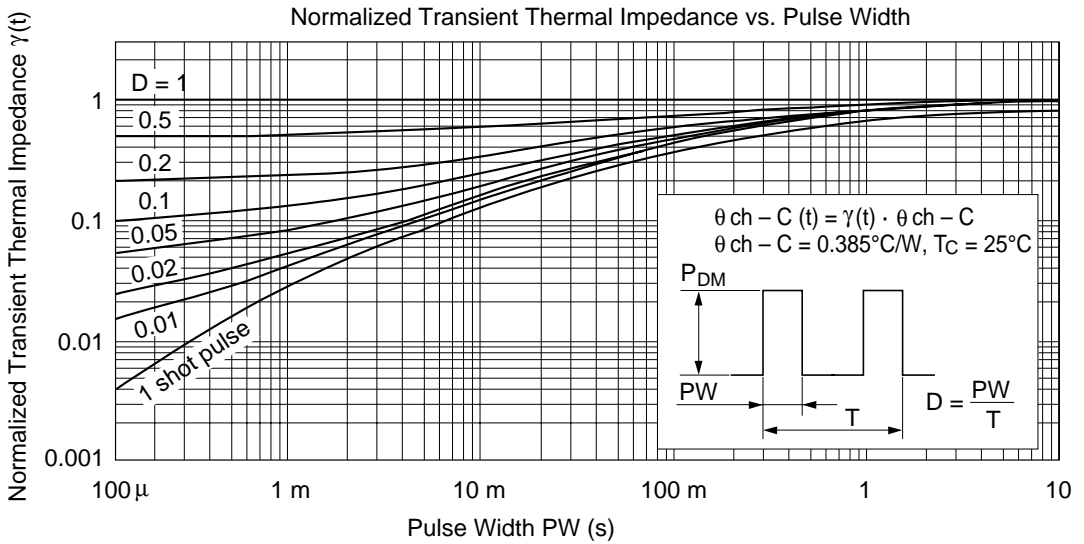
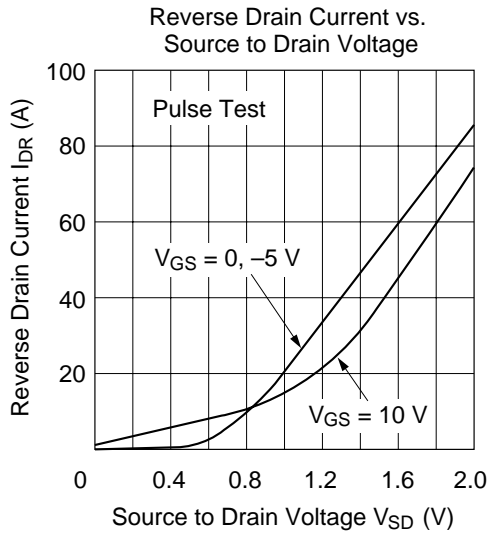


Dynamic Input Characteristics

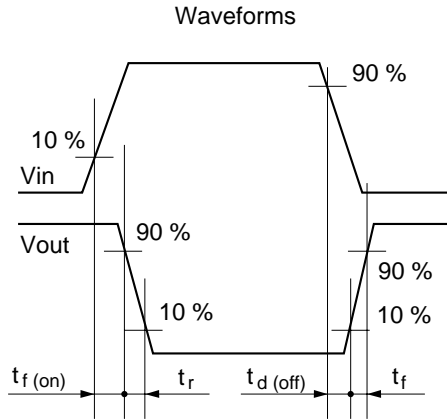
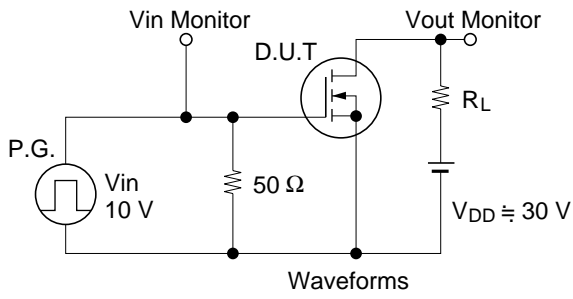


Switching Characteristics





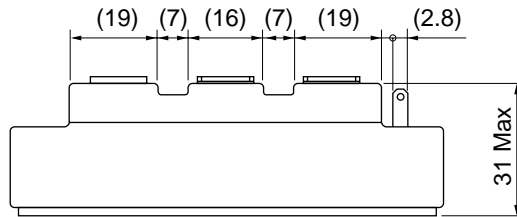
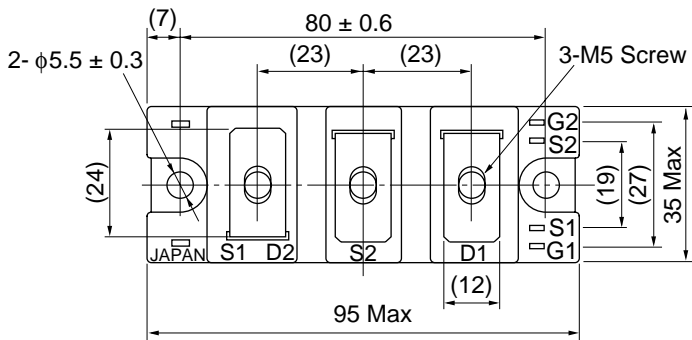
Switching Time Test Circuit





Package Dimensions

Unit: mm



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