# PM4575J

Silicon N-Channel Power MOS FET Module

HITACHI

## Application

High Speed Power Switching

## Features

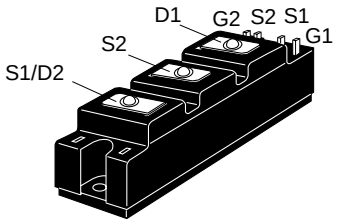
- Equipped with Power MOS FET
- Low on-resistance
- High speed switching
- Low drive current
- Wide area of safe operation
- Inherent parallel diode between source and drain
- Isolated base from Terminal
- Suitable for motor driver, switching regulator and etc.



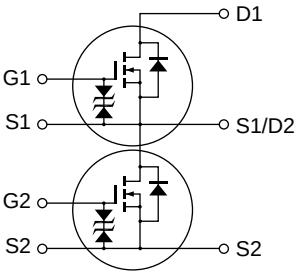
Hitachi semiconductor

## 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 | Pch*[1] | 300 | W |
| Channel temperature | Tch | 150 | °C |
| Storage temperature | Tstg | –45 to +125 | °C |
| Insulation dielectric | Viso*[2] | 2000 | Vrms |

Notes: 1. Value at Ta = 25°C
2. Base to terminals AC minute

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

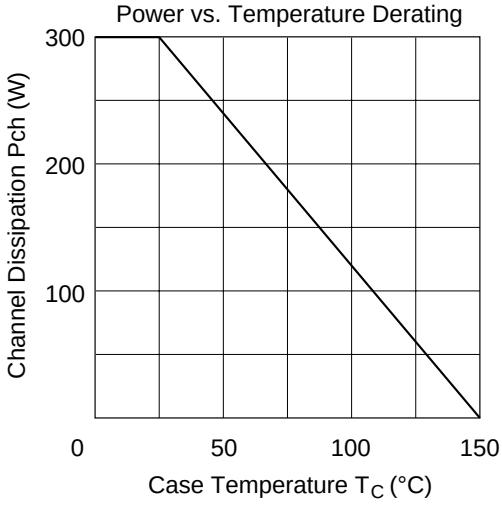
| Item | Symbol | Min | Typ | Max | Unit | Test conditions |
|---|---|---|---|---|---|---|
| Drain to source breakdown voltage | $V_{(BR)DSS}$ | 450 | — | — | V | $I_D$ = 10 mA, $V_{GS}$ = 0 V |
| Gate to source leak current | $I_{GSS}$ | — | — | ±10 | µA | $V_{GS}$ = ± 25 V, $V_{DS}$ = 0 V |
| Gate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

Note: 1. Pulse Test

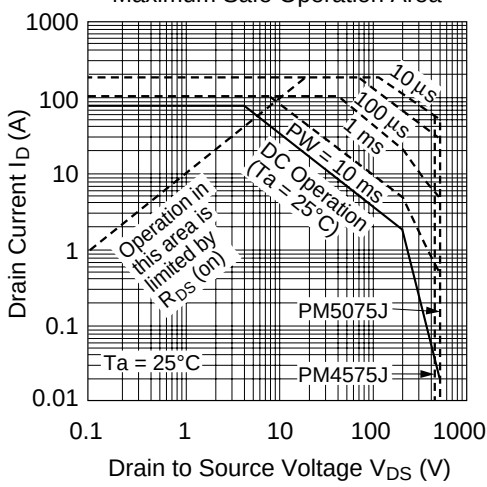
## Mechanical Characteristics

| 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 |

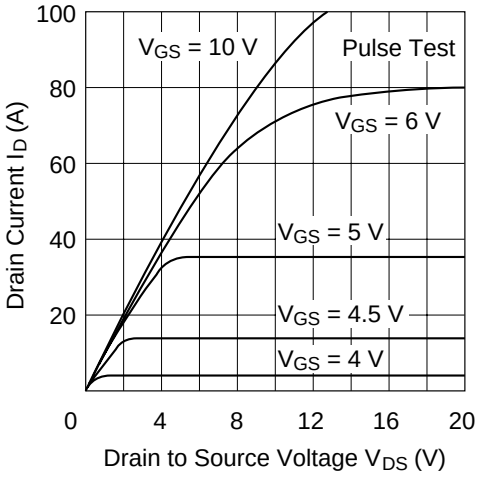
Power vs. Temperature Derating



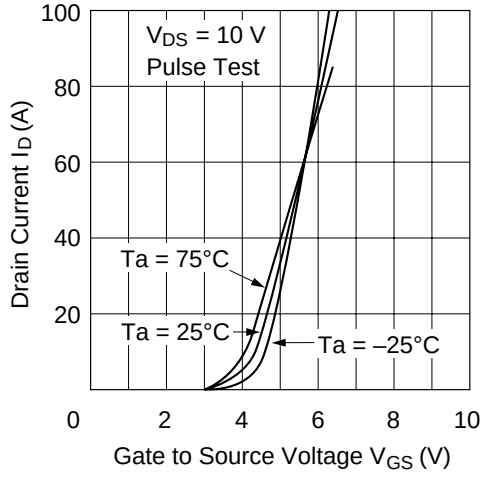

Maximum Safe Operation Area



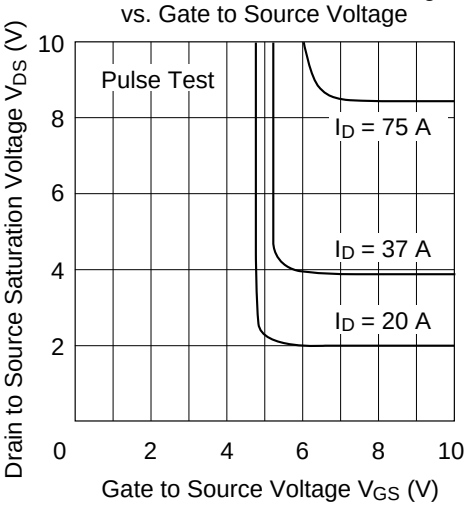

Typical Output Characteristics



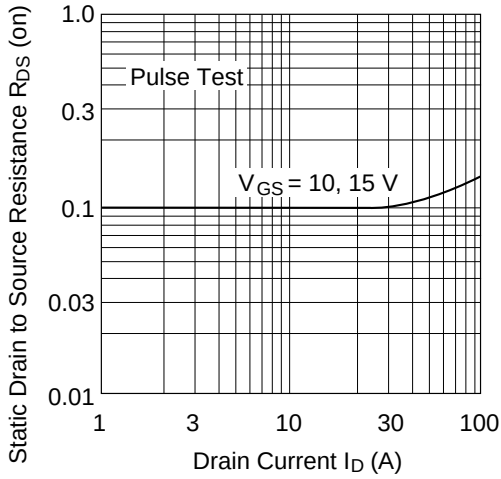

Typical Transfer Characteristics



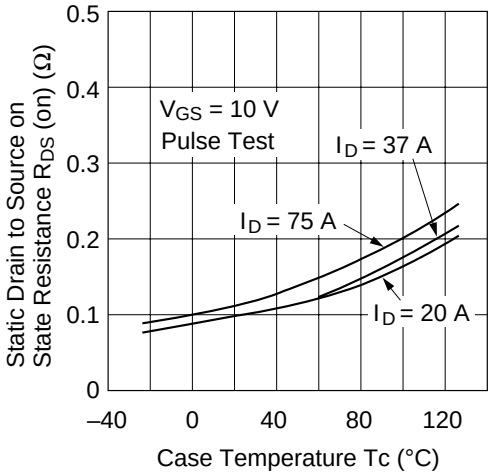
Drain to Source Saturation Voltage vs. Gate to Source Voltage



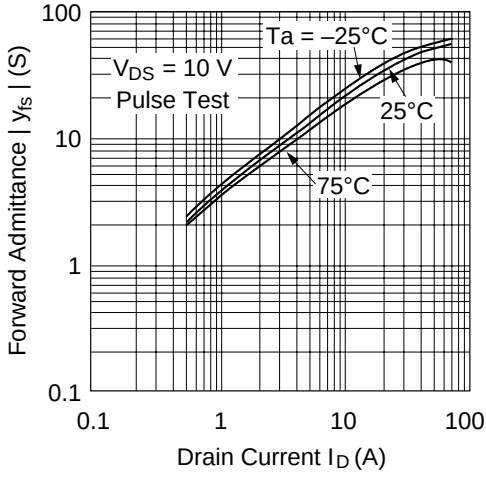

Static Drain to Source on State Resistance vs. Drain Current



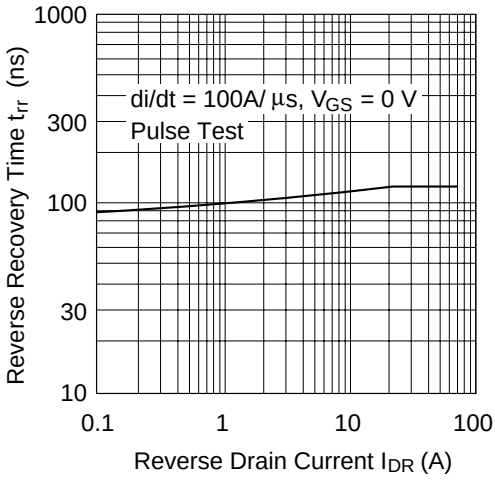

Static Drain to Source on State Resistance vs. Temperature



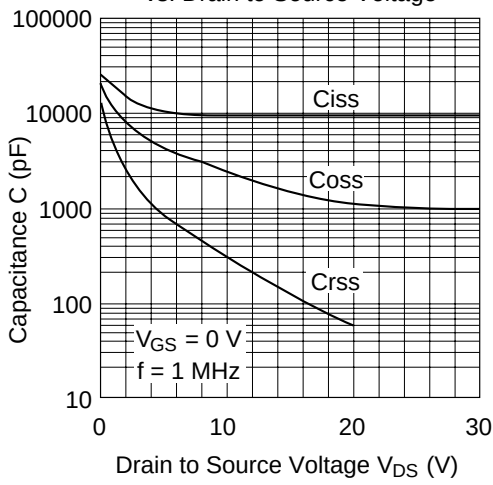

Forward Transfer Admittance vs. Drain Current



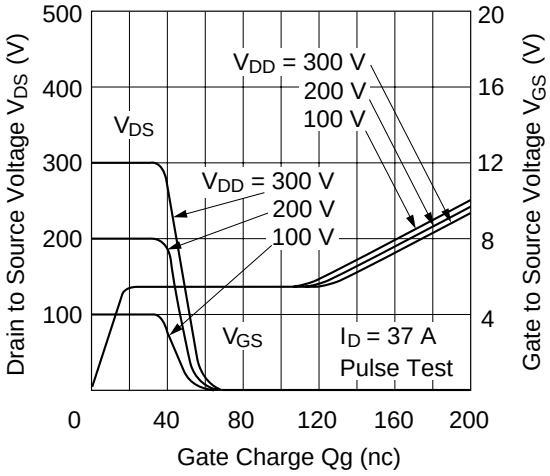
Body to Drain Diode Reverse Recovery Time



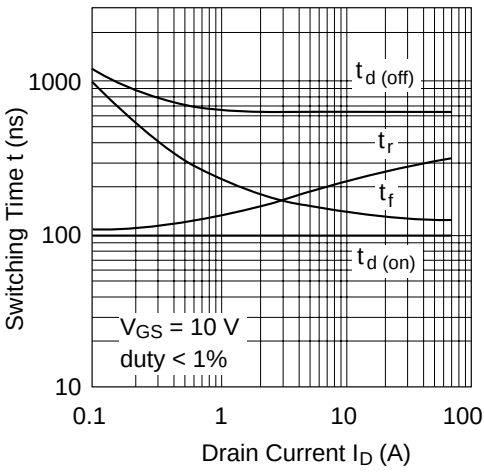

Typical Capacitance vs. Drain to Source Voltage



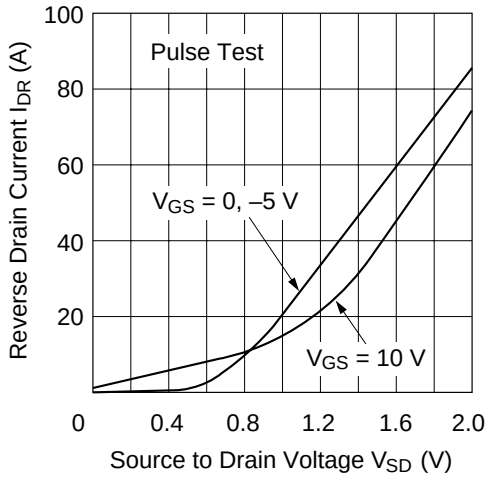

Dynamic Input Characteristics



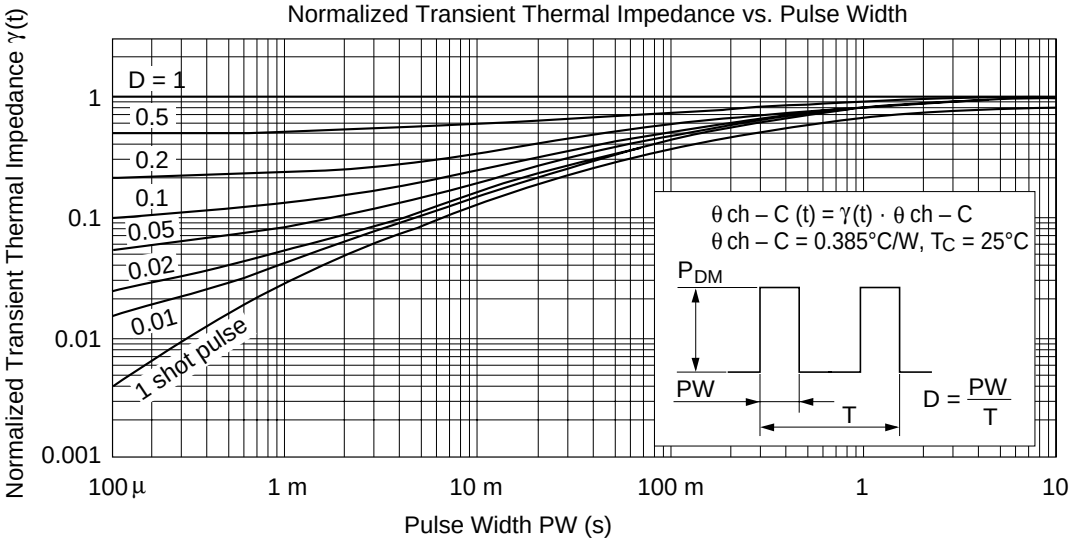

Switching Characteristics



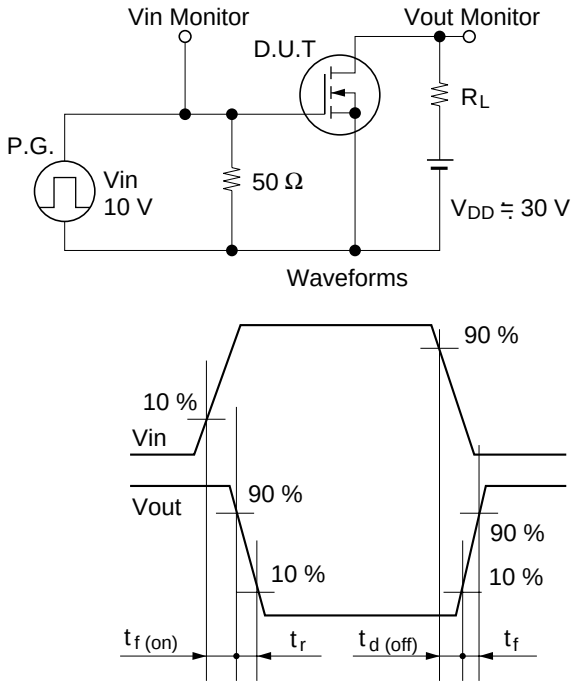
Reverse Drain Current vs.
Source to Drain Voltage




Normalized Transient Thermal Impedance vs. Pulse Width

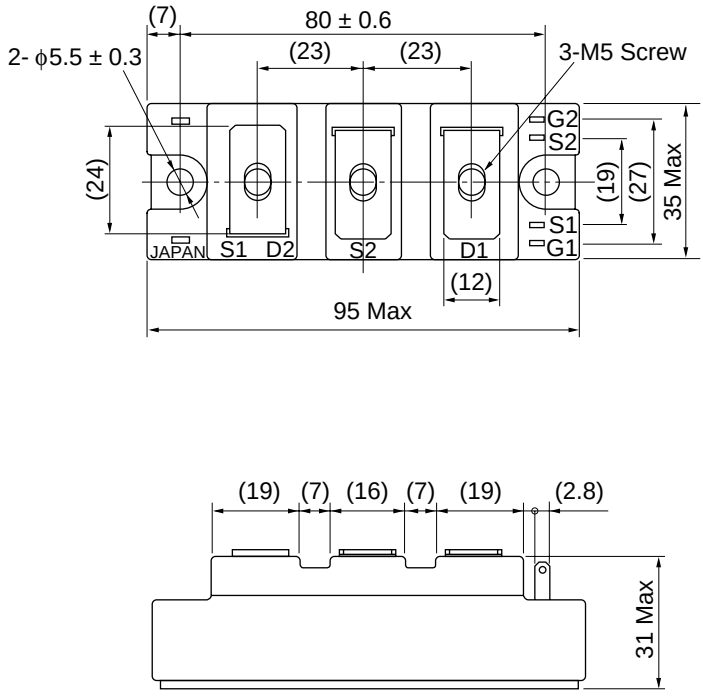


Switching Time Test Circuit



## Package Dimensions

Unit: mm



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