HITACHI

PM45150K

Silicon N-Channel Power MOS FET Module for High-Speed Power Switching

Features

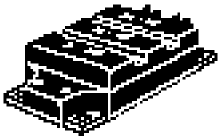
- Equipped with Power MOS FET
- Low on-resistance
- High speed switching
- Low drive current
- Wide area of safe operation
- Inherent parallel diode between source and drain
- Isolated base from Terminal
- Suitable for motor driver, switching regulator and etc.

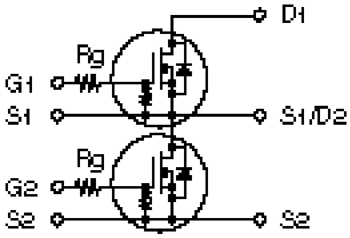
Absolute Maximum Ratings (Ta = 25°C) (Per FET chip)

Item	Symbol	Rating	Unit
Drain source voltage	$V_{(BR)DSS}$	450	V
Gate source voltage	$V_{(BR)GSS}$	±30	V
Drain current	I_D	150	A
Drain peak current	$I_{D(peak)}$	360	A
Body-drain diode reverse drain current	I_{DR}	150	A
Body-drain diode reverse peak current	$I_{DR(peak)}$	360	A
Channel dissipation	Pch[*1]	500	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–45 to +125	°C
Insulation dissipation	Viso[*2]	2000	Vrms

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

Pin Arrangement





Symbol	Electrode	Terminals	Remarks
S1	Source 1	M5 screw	Power terminal
D1	Drain 1	M5 screw	Power terminal
S2	Source 2	M5 screw	Power terminal
D2	Drain 2	M5 screw	Power terminal
G1	Gate 1	# 110	Signal terminal
S1	Source 1	# 110	Signal terminal
G2	Gate 2	# 110	Signal terminal
S2	Source 2	# 110	Signal terminal

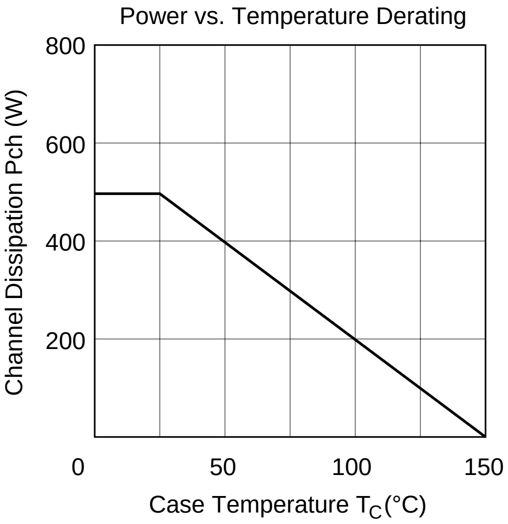
Electrical Characteristics (Ta = 25°C) (Per FET chip)

Item	Symbol	Min	Typ	Max	Unit	Test Condition
Drain-source breakdown voltage	$V_{(BR)DSS}$	450	—	—	V	I_D = 10 mA, V_{GS}= 0 V
Gate-source leak current	I_{GSS}	—	—	±10	µA	V_{GS} = ± 25 V, V_{DS} = 0 V
Gate-source breakdown voltage	$V_{(BR)GSS}$	±30	—	—	V	I_G = ±100 µA, V_{DS} = 0 V
Drain leak current	I_{DSS}	—	—	1	mA	V_{DS} = 360 V, V_{GS} = 0 V
Gate-source threshold voltage	$V_{GS(th)}$	2.0	—	3.0	V	I_D = 1 mA, V_{DS} = 10 V
Drain-source saturation voltage	$V_{DS(on)}$	—	4.5	6.0	V	I_D = 75 A, V_{GS} = 10 V^{*1}
Static Drain-source on state resistance	$R_{DS(on)}$	—	0.06	0.08	Ω	I_D = 75 A, V_{GS} = 10 V^{*1}
Forward transfer admittance	$\lvert y_{fs} \rvert$	—	80	—	S	I_D = 75 A, V_{DS} = 10 V^{*1}
Input capacitance	Ciss	—	22600	—	pF	V_{DS} = 10 V, V_{GS} = 0 V
Output capacitance	Coss	—	4600	—		f = 1 MHz
Reverse transfer capacitance	Crss	—	580	—		
Turn-on delay time	$t_{d(on)}$	—	280	—	ns	I_D = 75 A, V_{GS} = 10 V
Rise time	t_r	—	820	—		Rg = 50 Ω
Turn-off delay time	$t_{d(off)}$	—	1190	—		R_L = 0.4 Ω
Fall time	t_f	—	400	—		
Body-drain diode forward voltage	V_{DF}	—	2.0	—	V	I_F = 150 A, V_{GS} = 0 V
Body-drain diode reverse recovery time	t_{rr}	—	140	—	ns	I_F = 150 A, V_{GS} = 0 V di/dt = 100 A/µs

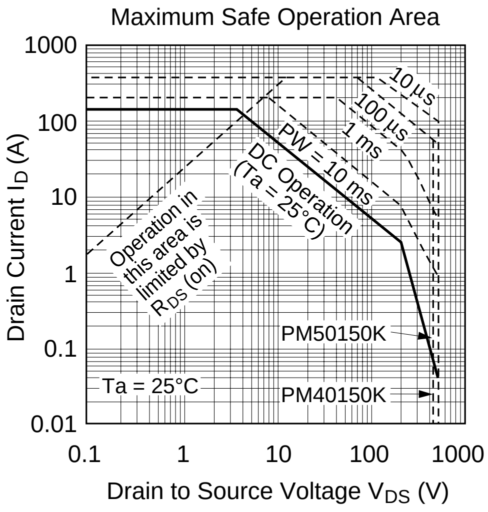
Note: 1. Pulse Test

Mechanical characteristics

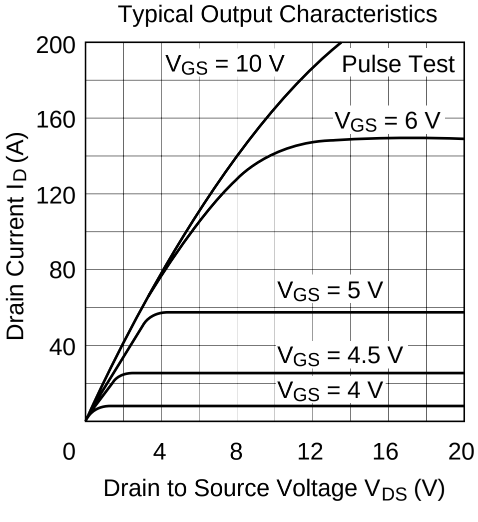
Item	Symbol	Condition	Rating	Unit
Fixing strength	—	Mounting into main-terminal with M4 screw	1.45 to 1.95	N-m
	—	Mounting into heat sink with M5 screw	1.95 to 2.9	N-m
Weight	—	Typical value	380	g



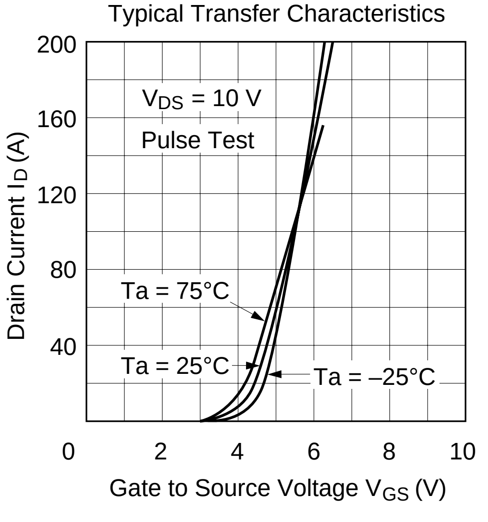
Power vs. Temperature Derating



Maximum Safe Operation Area

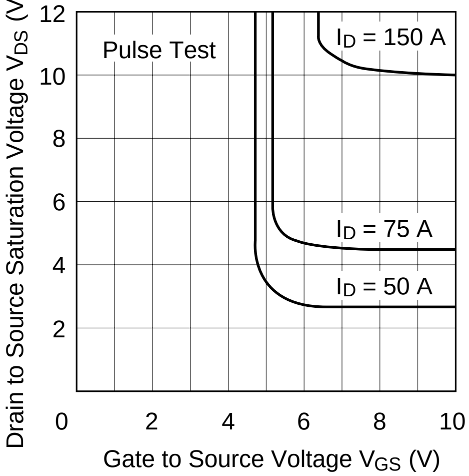


Typical Output Characteristics

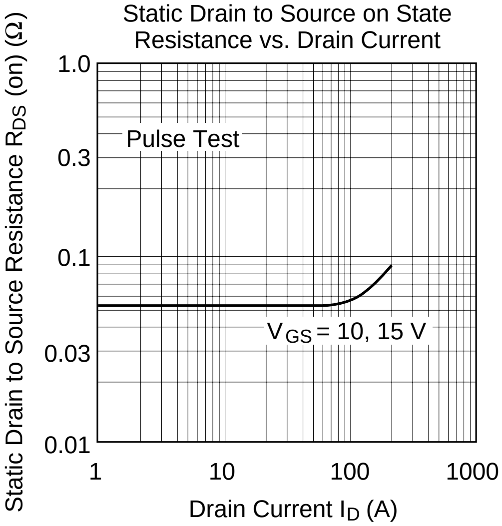


Typical Transfer Characteristics

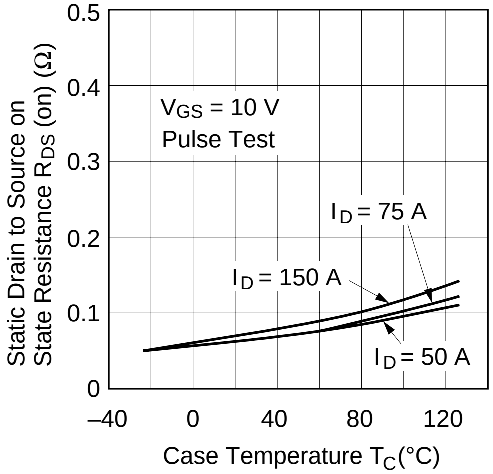
Drain to Source Saturation Voltage vs. Gate to Source Voltage



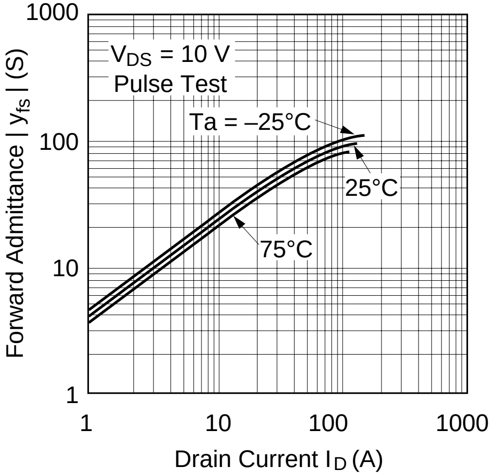
Static Drain to Source on State Resistance vs. Drain Current

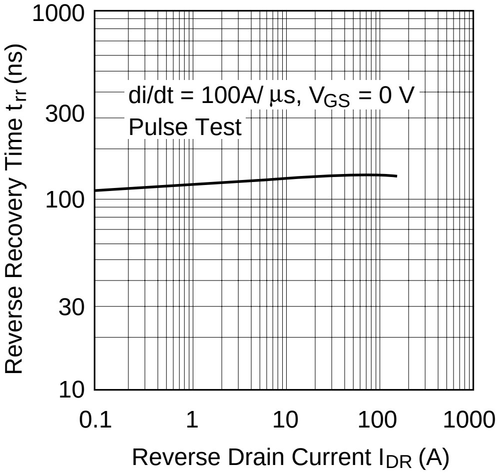


Static Drain to Source on State Resistance vs. Temperature

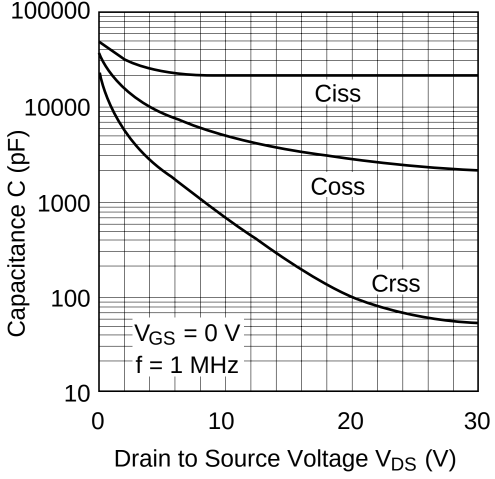


Forward Transfer Admittance vs. Drain Current

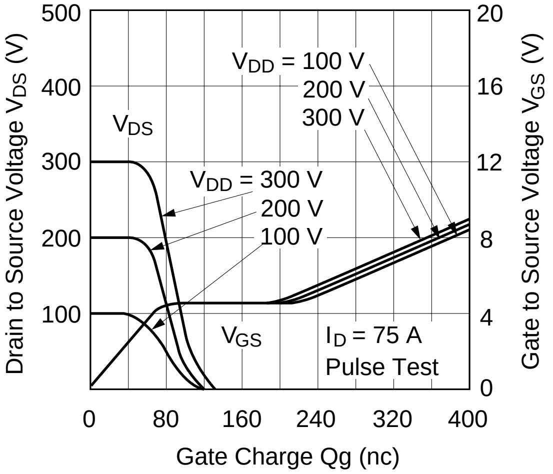




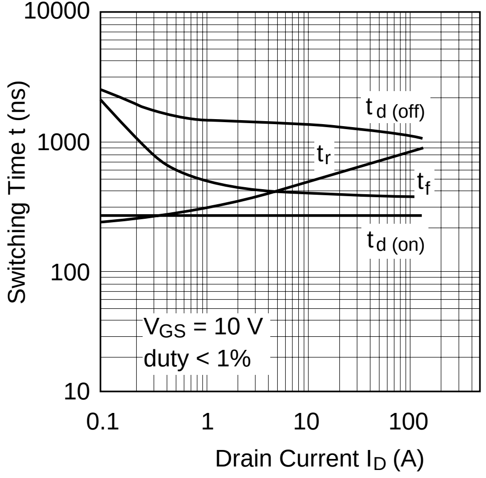
Body to Drain Diode Reverse Recovery Time



Typical Capacitance vs. Drain to Source Voltage

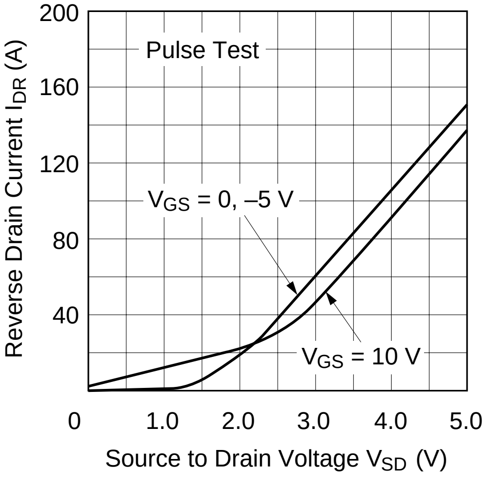


Dynamic Input Characteristics

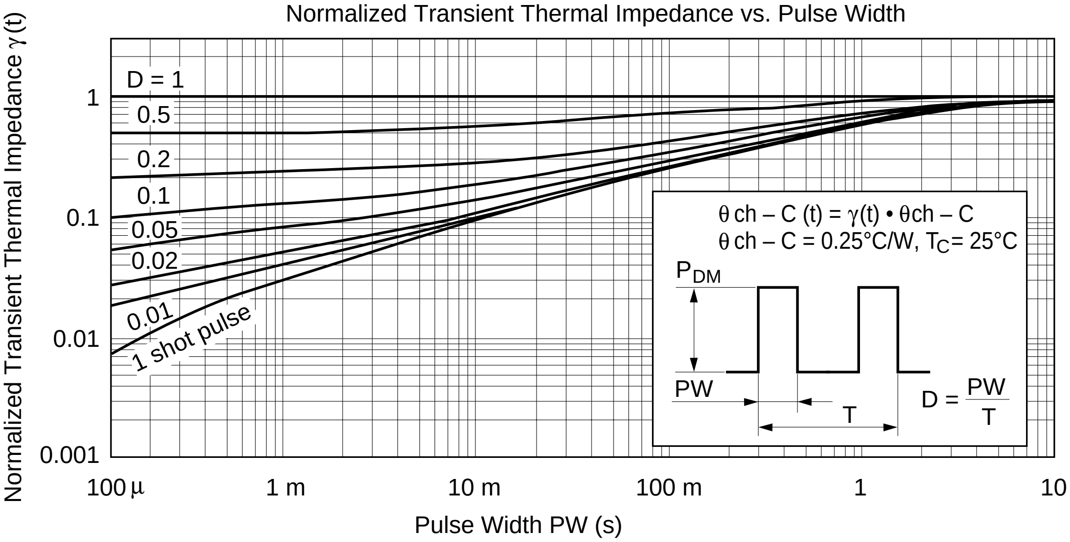


Switching Characteristics

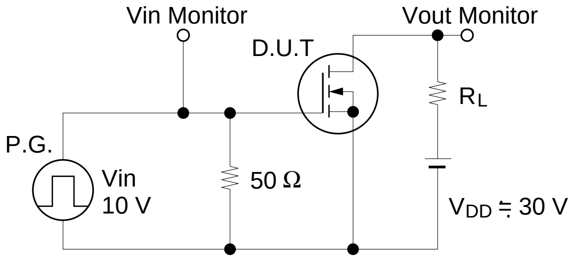
Reverse Drain Current vs.
Source to Drain Voltage



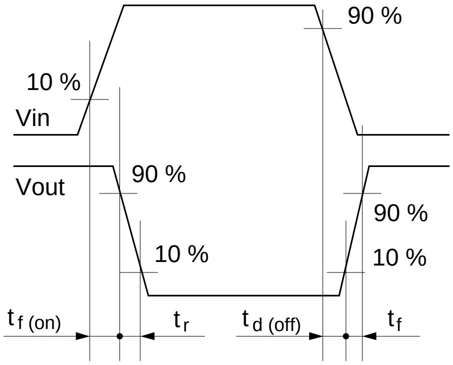
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



Wave Forms



Package Dimensions

Unit: mm