
PM45100K

Silicon N-Channel Power MOS FET Module

HITACHI

November 1996

Application

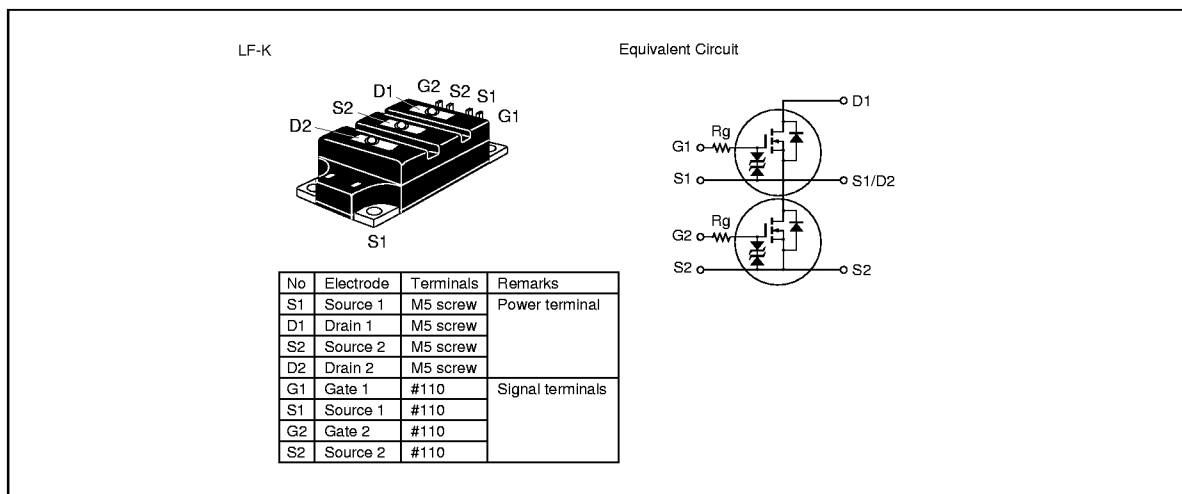
High Speed Power Switching

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.

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Outline



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	100	A
Drain peak current	$I_{D(peak)}$	240	A
Body to drain diode reverse drain current	I_{DR}	100	A
Body to drain diode reverse peak current	$I_{DR(peak)}$	240	A
Channel dissipation	P_{ch}^{*1}	400	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

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

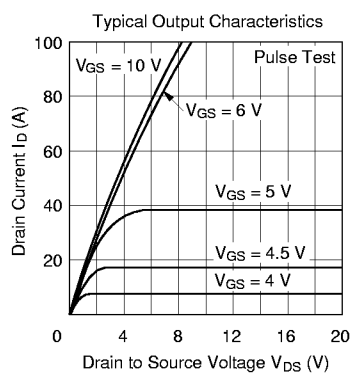
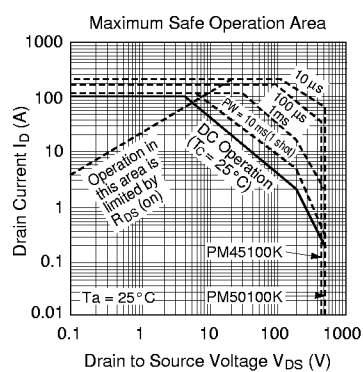
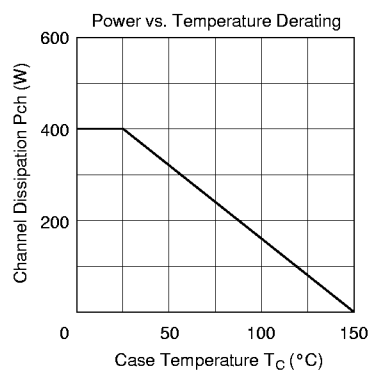
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	450	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0 \text{ V}$
Gate to source leak current	I_{GSS}	—	—	±10	μA	$V_{GS} = \pm 25 \text{ V}$, $V_{DS} = 0 \text{ V}$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±30	—	—	V	$I_G = \pm 100 \text{ μA}$, $V_{DS} = 0 \text{ V}$
Drain leak current	I_{DSS}	—	—	1	mA	$V_{DS} = 360 \text{ V}$, $V_{GS} = 0 \text{ V}$
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	$V_{DS(on)}$	—	4.0	5.0	V	$I_D = 50 \text{ A}$, $V_{GS} = 10 \text{ V}^{*1}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.08	0.10	Ω	$I_D = 50 \text{ A}$, $V_{GS} = 10 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	—	55	—	S	$I_D = 50 \text{ A}$, $V_{DS} = 10 \text{ V}^{*1}$
Input capacitance	C_{iss}	—	14600	—	pF	$V_{DS} = 10 \text{ V}$, $V_{GS} = 0 \text{ V}$ $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	3500	—		
Reverse transfer capacitance	C_{rss}	—	650	—		
Turn-on delay time	$t_{d(on)}$	—	200	—	ns	$I_D = 50 \text{ A}$, $V_{GS} = 10 \text{ V}$ $R_g = 50 \text{ Ω}$ $R_L = 0.6 \text{ Ω}$
Rise time	t_r	—	690	—		
Turn-off delay time	$t_{d(off)}$	—	760	—		
Fall time	t_f	—	260	—		
Body to drain diode forward voltage	V_{DF}	—	1.6	—	V	$I_F = 100 \text{ A}$, $V_{GS} = 0 \text{ V}$
Body to drain diode reverse recovery time	t_{rr}	—	140	—	ns	$I_F = 100 \text{ A}$, $V_{GS} = 0 \text{ V}$ $di/dt = 100 \text{ A/μs}$

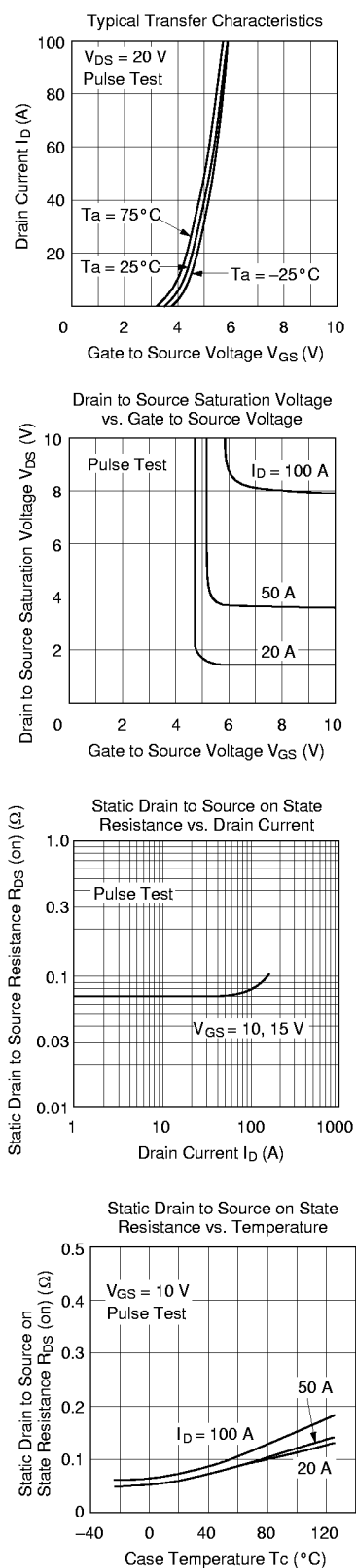
Note 1. Pulse Test

Mechanical Characteristics

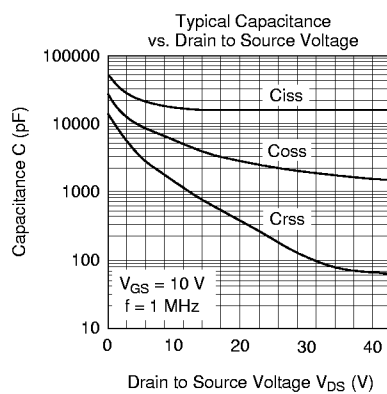
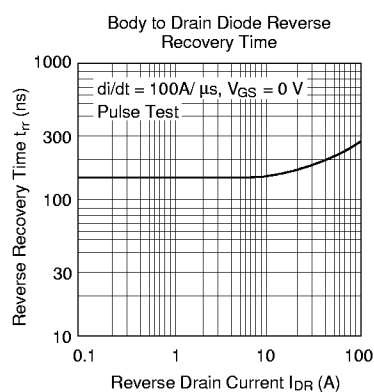
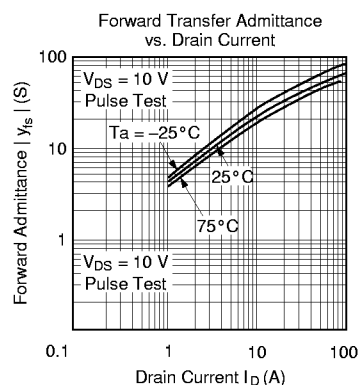
Item	Symbol	Condition	Rating	Unit
Fixing strength	—	Mounting into main-terminal with M4 screw	1.45 to 1.95	N-m
	—	Mounting into heat sink with M5 screw	1.95 to 2.9	N-m
Weight	—	Typical value	380	g

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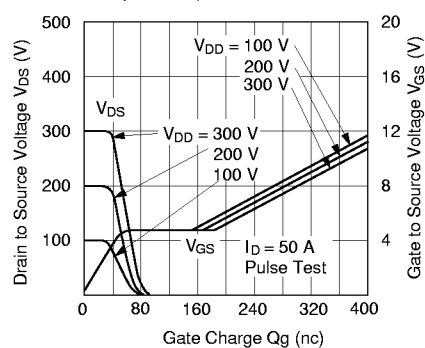
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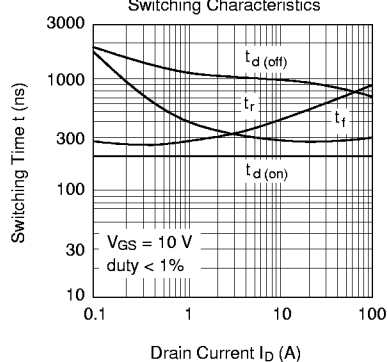


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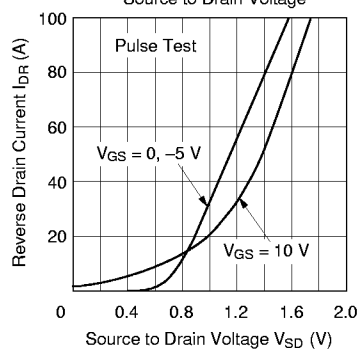
Dynamic Input Characteristics



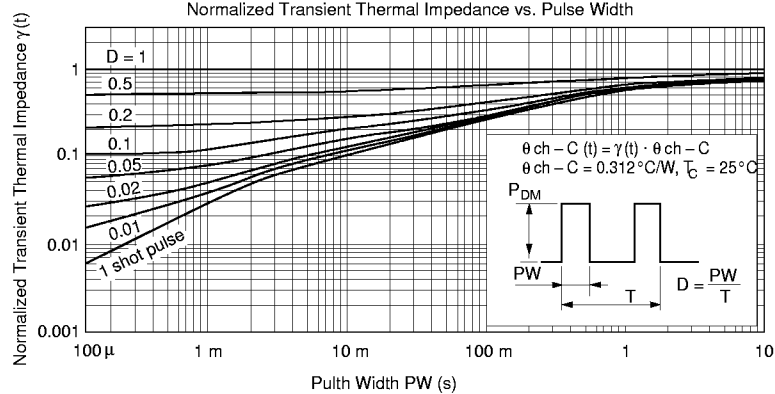
Switching Characteristics



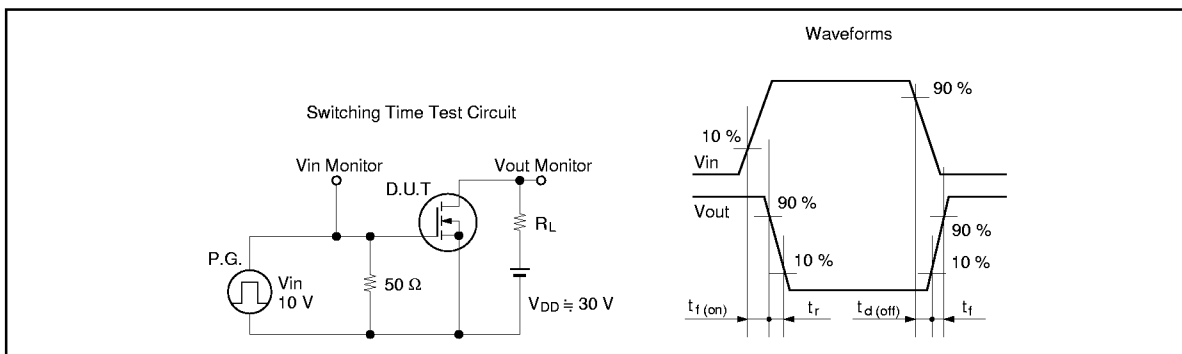
Reverse Drain Current vs. Source to Drain Voltage



Normalized Transient Thermal Impedance vs. Pulse Width



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Unit: mm



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