
PM45502C

Silicon N-Channel Power MOS FET Module

HITACHI

November 1996

Application

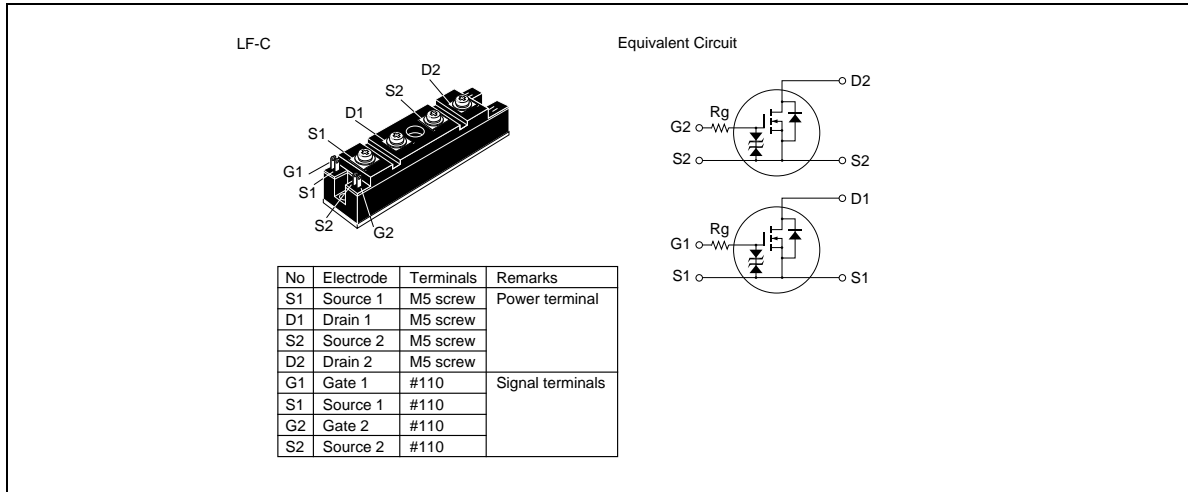
High Speed Power Switching

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_{DSS}	450	V
Gate source voltage	V_{GSS}	±20	V
Drain current	I_D	50	A
Drain peak current	$I_{D(peak)}$	100	A
Body to drain diode reverse drain current	I_{DR}	50	A
Body to drain diode reverse drain peak current	$I_{DR(peak)}$	100	A
Channel dissipation	P_{ch}^{*1}	300	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	-45 to +125	°C
Insulation dielectric	V_{isol}^{*2}	2000	V

- Notes
1. Value at Tc = 25°C
 2. Base to terminals AC minute

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

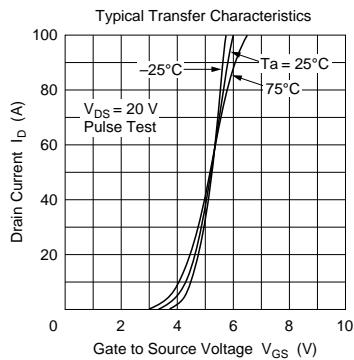
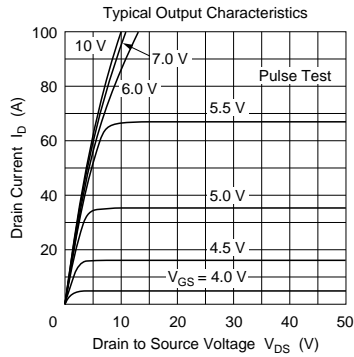
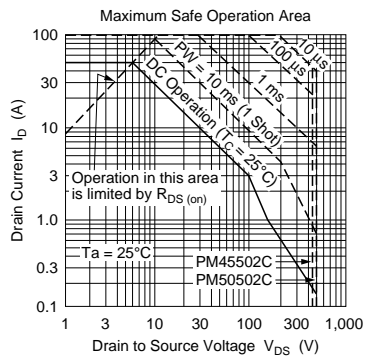
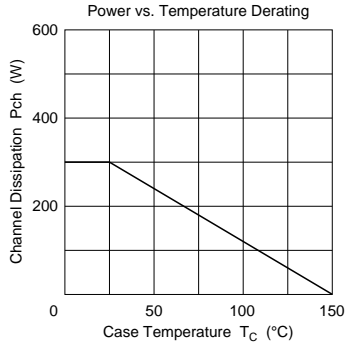
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	450	—	—	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	±50	μA	$V_{GS} = \pm 16 \text{ V}, V_{DS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	—	—	V	$I_G = \pm 100 \text{ μA}, V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	1	mA	$V_{DS} = 360 \text{ V}, V_{GS} = 0$
Gate to source threshold voltage	$V_{GS(th)}$	1.5	—	4.0	V	$I_D = 1 \text{ mA}, V_{DS} = 10 \text{ V}$
Drain to source saturation voltage	$V_{DS(on)}$	—	2.0	3.0	V	$I_D = 25 \text{ A}, V_{GS} = 10 \text{ V}^{*1}$
Static Drain to source on state resistance	$R_{DS(on)}$	—	0.08	0.12	Ω	$I_D = 25 \text{ A}, V_{GS} = 10 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	25	40	—	S	$I_D = 25 \text{ A}, V_{DS} = 10 \text{ V}^{*1}$
Input capacitance	C_{iss}	—	10250	—	pF	$V_{DS} = 10 \text{ V}, V_{GS} = 0$
Output capacitance	C_{oss}	—	3600	—	pF	$f = 1 \text{ MHz}$
Reverse transfer capacitance	C_{rss}	—	400	—	pF	
Turn-on delay time	$t_{d(on)}$	—	150	—	ns	$I_D = 25 \text{ A}, V_{GS} = 10 \text{ V}$
Rise time	t_r	—	700	—	ns	$R_L = 1.2 \text{ Ω}$
Turn-off delay time	$t_{d(off)}$	—	800	—	ns	
Fall time	t_f	—	600	—	ns	
Body to drain diode forward voltage	V_{DF}	—	1.2	—	V	$I_F = 25 \text{ A}, V_{GS} = 0$
Body to drain diode reverse recovery time	t_{rr}	—	200	—	ns	$I_F = 25 \text{ A}, V_{GS} = 0$ $diF/dt = 100 \text{ A/μs}$

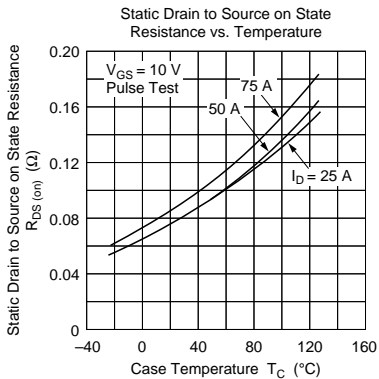
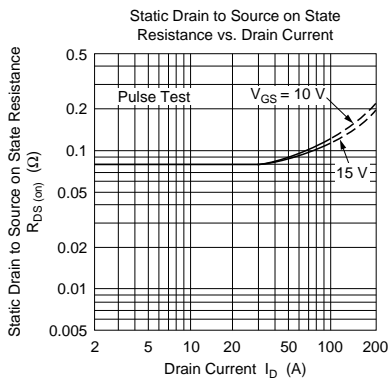
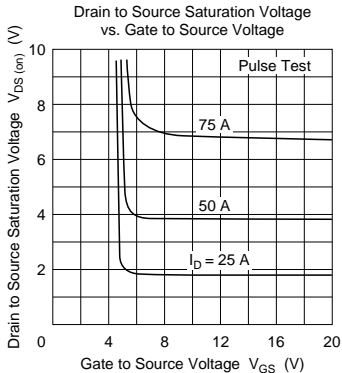
Note 1. Pulse Test

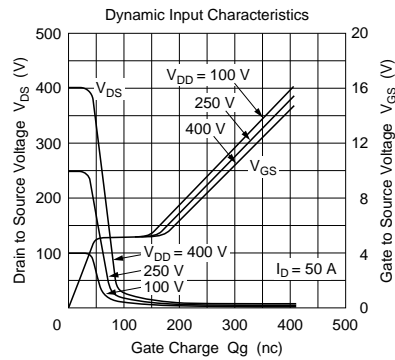
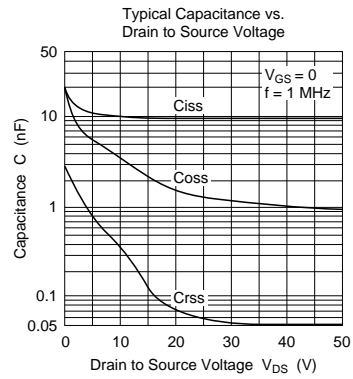
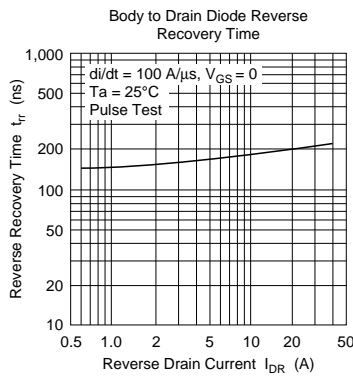
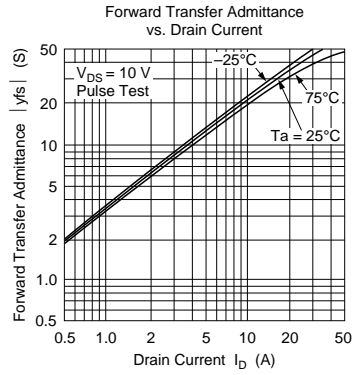
Mechanical Characteristics

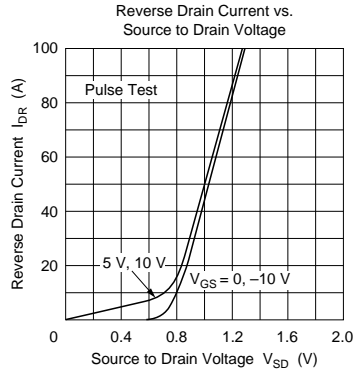
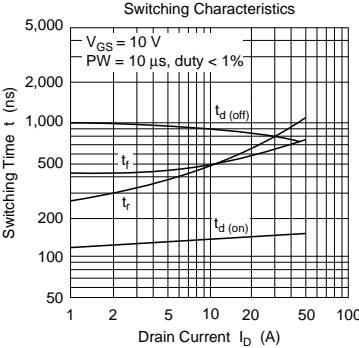
Item	Symbol	Condition	Rating	Unit
Fixing strength	—	Mounting into main-terminal with M5 screw	15 to 20	kg•cm
	—	Mounting into heat sink with M6 screw	20 to 30	kg•cm
Weight	—	Typical value	300	g

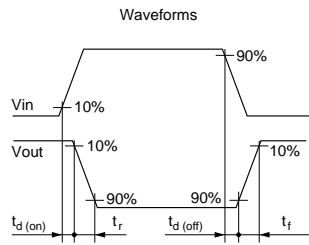
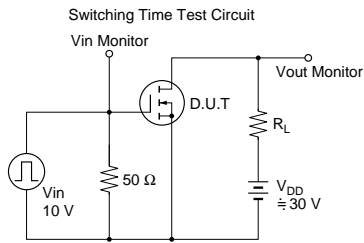
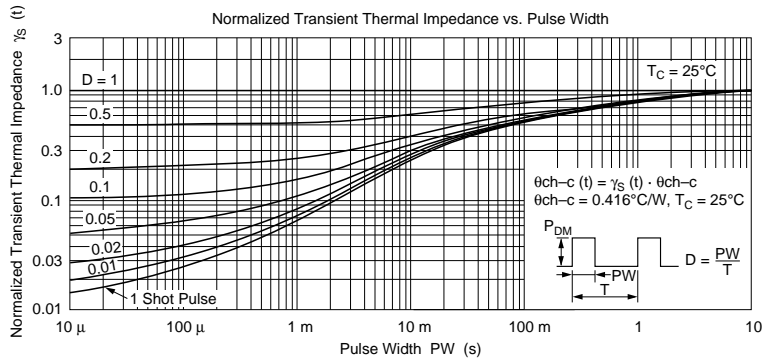
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