Nihon Inter Electronics Corporation

MOSFET MODULE Dual 50A 450V/500V PD7M441H / PD7M440H

FEATURES

* Dual MOS FETs Cascaded Circuit
* Prevented Body Diodes of MOSFETs by SBDs, and Ultra Fast Recovery Diodes Connected in Parallel
* 300KHz High Speed Switching Possible

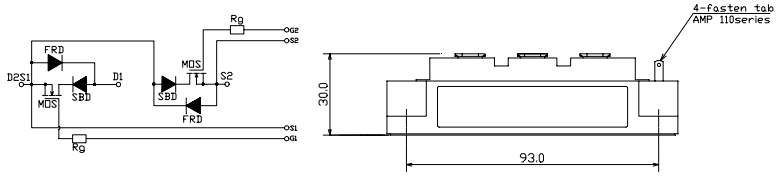
TYPICAL APPLICATIONS

* Power Supply for the Communications and the Induction Heating

OUTLINE DRAWING

Dimension(mm)

Circuit



MAXMUM RATINGS

Ratings		Symbol	PD7M441H	PD7M440H	Unit
Drain-Source Voltage (V_{GS}=0V)		V_{DSS}	450	500	V
Gate - Source Voltage		V_{GSS}	+/- 20		V
Continuous Drain Current	Duty=50%	I_D	50 (Tc=25°C)		A
	D.C.		35 (Tc=25°C)		
Pulsed Drain Current		I_{DM}	100 Tc=25°C)		A
Total Power Dissipation		P_D	350 Tc=25°C)		W
Operating Junction Temperature Range		T_{jw}	-40 to +150		°C
Storage Temperature Range		T_{stg}	-40 to +125		°C
Isolation Voltage Terminals to Base AC, 1 min.)		V_{ISO}	2000		V
Mounting Torque	Module Base to Heatsink	F_{TOR}	3.0		N•m
	Bus Bar to Main Terminals		2.0		

ELECTRICAL CHARACTERISTICS (@Tc=25°C unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=V_{DSS},V_{GS}=0V	-	-	1.0	mA
		T_j=125°C, V_{DS}=V_{DSS},V_{GS}=0V	-	-	4.0	
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=1mA	2.0	3.1	4.0	V
Gate-Source Leakage Current	I_{GSS}	V_{GS}=+/- 20V,V_{DS}=0V	-	-	1.0	μA
Static Drain-Source On-Resistance	$r_{DS(on)}$	V_{GS}=10V, I_D=25A	-	110	120	m-ohm
Drain-Source On-Voltage	$V_{DS(on)}$	V_{GS}=10V, I_D=25A	-	3.2	3.4	V
Forward Transconductance	g_{fs}	V_{DS}=15V, I_D=25A	-	45	-	S
Input Capacitance	C_{ies}	V_{DS}=25V,V_{GS}=0V,f=1MHz	-	9.0	-	nF
Output Capacitance	C_{oss}		-	1.7	-	nF
Reverse Transfer Capacitance	C_{rss}		-	0.32	-	nF
Turn-On Delay Time	$t_{d(on)}$	V_{DD}= 1/2V_{DSS}	-	120	-	ns
Rise Time	t_r	I_D=25A	-	80	-	
Turn-Off Delay Time	$t_{d(off)}$	V_{GS}= -5V, +10V	-	240	-	
Fall Time	t_f	R_G= 7ohm	-	50	-	

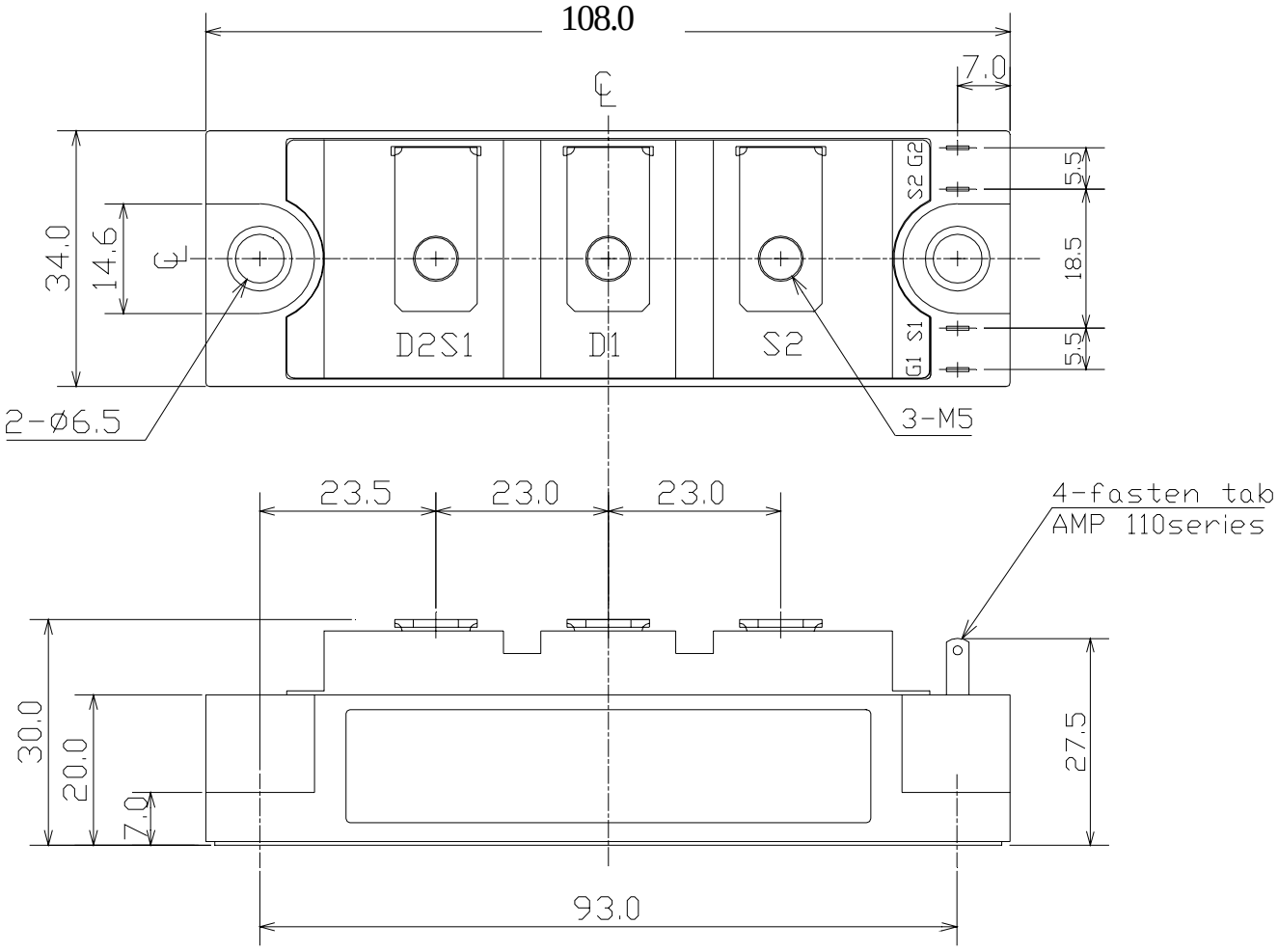
FREE WHEELING DIODES RATINGS & CHARACTERISTICS (Tc=25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Continuous Source Current	I_S	D.C.	-	-	35	A
Pulsed Source Current	I_{SM}	-	-	-	100	A
Diode Forward Voltage	V_{SD}	I_S=50A	-	-	1.9	V
Reverse Recovery Time	t_{rr}	I_S=50A, -dis/dt=100A/μs	-	100	-	ns
Reverse Recovery	Q_r		-	0.15	-	μC

THERMAL CHARACTERISTICS

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	MOS FET	-	-	0.36	°C/W
		Diode	-	-	2.0	
Thermal Resistance, Case to Heatsink	$R_{th(c-f)}$	Mounting surface flat, smooth, and greased	-	-	0.1	

PD7M44xH


108.0
7.0
34.0
14.6
5.5
18.5
5.5
S2 G2
G1 S1
D2S1
D1
S2
2-ø6.5
3-M5
23.5
23.0
23.0
4-fasten tab
AMP 110series
30.0
20.0
7.0
27.5
93.0

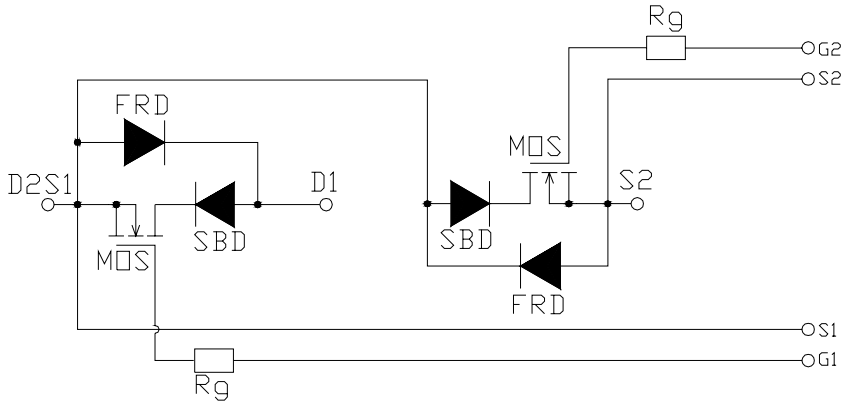

Rg
G2
S2
FRD
MOS
D2S1
D1
S2
SBD
SBD
MOS
FRD
S1
G1
Rg

Fig. 1 Typical Output Characteristics

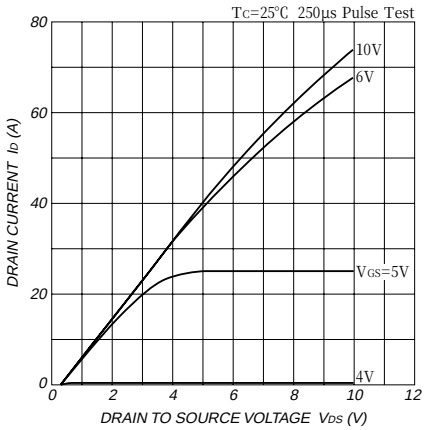


Fig. 2 Typical Drain-Source On-Voltage Vs. Gate-Source Voltage

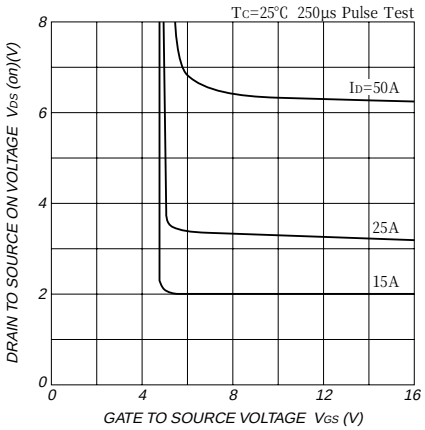


Fig. 3 Typical Drain-Source On Voltage Vs. Junction Temperature

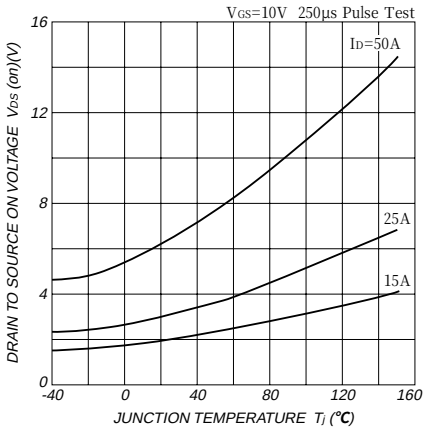


Fig. 4 Typical Capacitance Vs. Drain-Source Voltage

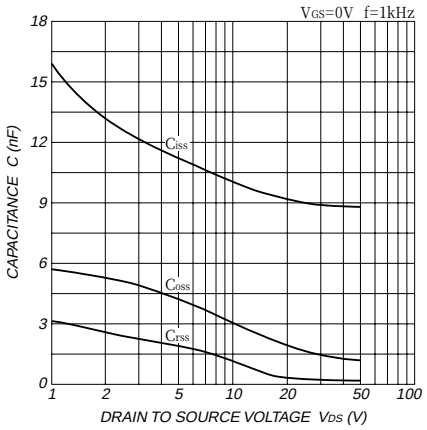


Fig. 5 Typical Gate Charge Vs. Gate-Source Voltage

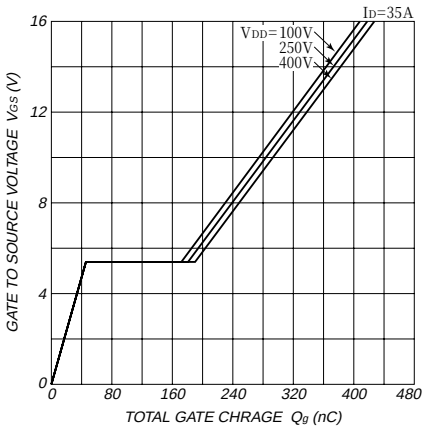


Fig. 6 Typical Switching Time Vs. Series Gate impedance

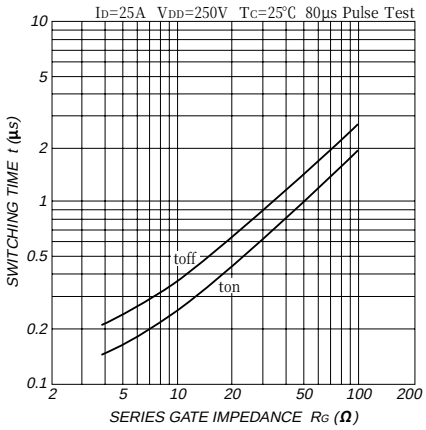


Fig. 7 Typical Switching Time Vs. Drain Current

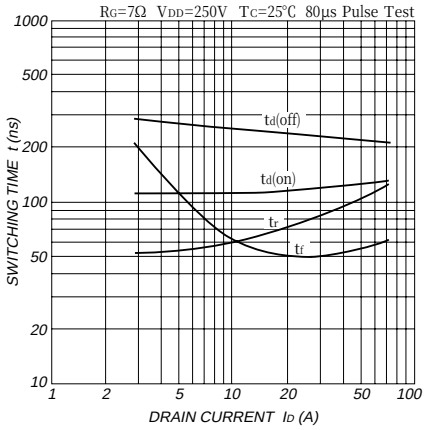


Fig. 8 Typical Source-Drain Diode Forward Characteristics

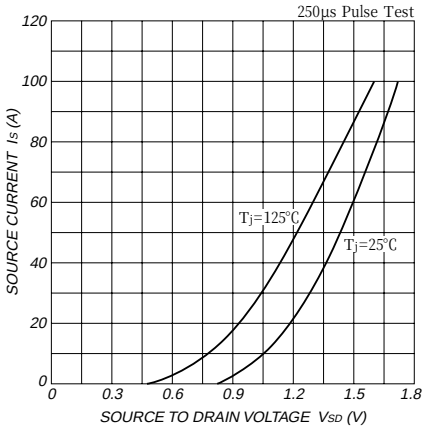


Fig. 9 Typical Reverse Recovery Characteristics

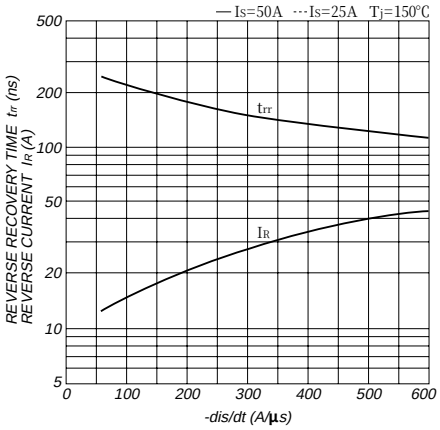


Fig. 10 Maximum Safe Operating Area

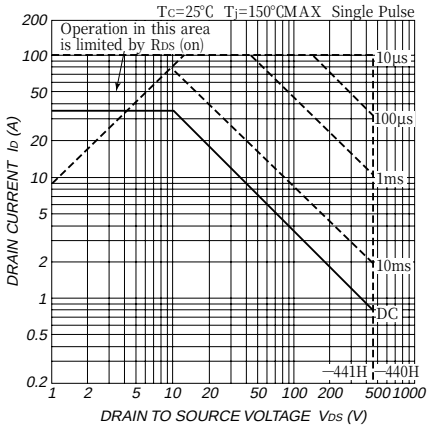


Fig. 11-1 Normalized Transient Thermal impedance(MOSFET)

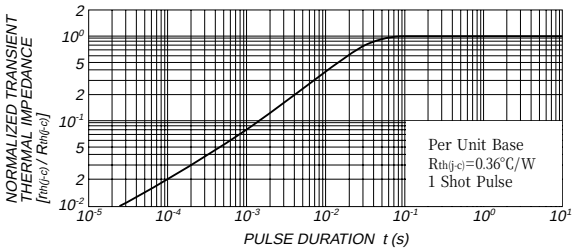


Fig. 11-2 Normalized Transient Thermal impedance(DIODE)