

DMM Technology Corp.
Dynamic Intelligent Power Module Series

DIPM50AP600

3φ, 50A, 600V

Features

- Complete isolation between Control Side and Power Side
2000Vrms insulation voltage.
- 3φ 600V 50A IGBT inverter bridge
- Direct PWM control input.
No external component requirements.
- Internal protection function
- Simple isolated signal interface
- High efficient switching. Low power loss.
- High DC bus voltage – up to +600VDC/High current
- Low thermal resistance
- Flat mount configuration

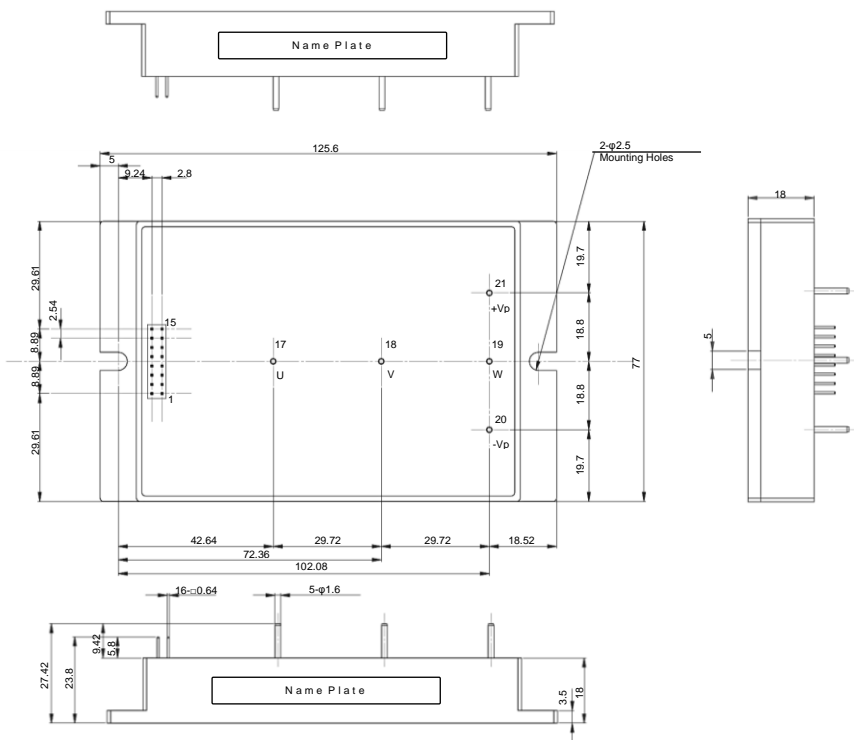


*Pre-Production Model Shown

Application

Small capacity 3-phase servo motor drive

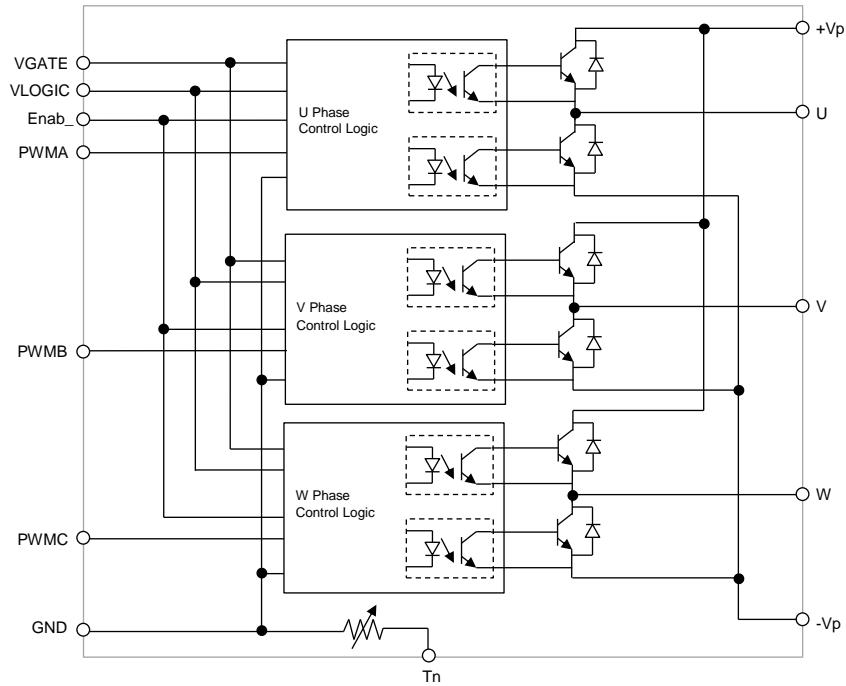
Package Outline



Terminal Configuration

Number	Name	Description
1-2	GND	Control side ground
3-4	PWMC	Control PWM for W phase
5-6	PWMB	Control PWM for V phase
7-8	PWMA	Control PWM for U phase
9-10	Enab_	Output enable, Active low
11-12	Tn	Thermal resistor output
13-14	VLOGIC	Control side +5VDC
15-16	VGATE	Control side +15VDC
17	U	Output PWM U phase
18	V	Output PWM V phase
19	W	Output PWM W phase
20	-Vp	Power side negative
21	+Vp	Power side positive

Internal Function Block Diagram



Maximum Ratings (T_j = 25°C)

Power Side

Symbol	Parameter	Condition	Ratings	Unit
VCES	Collector - Emitter Voltage	V _{gate} = 15V	600	V
±I _C	Collector Current	T _c = 25°C	50	A
		T _c = 100°C	30	A
I _C Pulse	Collector Current	T _c = 25°C	60	A
I _F	Diode average forward current	T _c = 25°C	20	A
I _F Pulse	Diode forward current	T _c = 25°C	50	A
T _j	Junction temperature		-20 ~ +150	°C
PC	Collector dissipation	T _c = 25°C	350	W

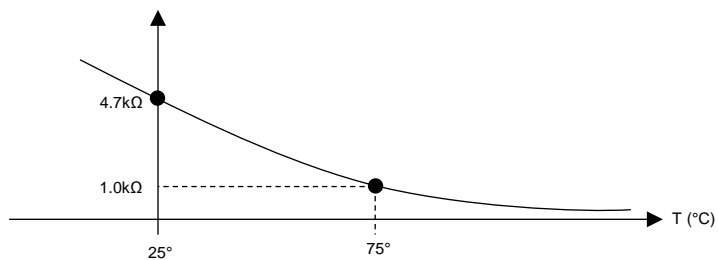
* : T_j = Junction temperature

** : T_c = Chip temperature measured under the chips

Control Side

Symbol	Parameter	Condition	Ratings	Unit
VGATE	Gate drive voltage	Applied between V _{gate} and GND	18	V
VLOGIC	Logic voltage	Applied between V _{logic} and GND	5.25	V
PWMA PWMB PWMC Enab_	PWM and Enable Input	Applied between inputs and GND	-0.1 ~ +5.25	V

Thermal Resistance Characteristics



Symbol	Parameter	Condition	Ratings	Unit
Rth	Thermal Resistance	Isolated	0.6	°C/W
R(th-c)	Contact Thermal Resistance	Fit to external heat sink	0.24	°C/W

Electrical Characteristics (T = 25°C)

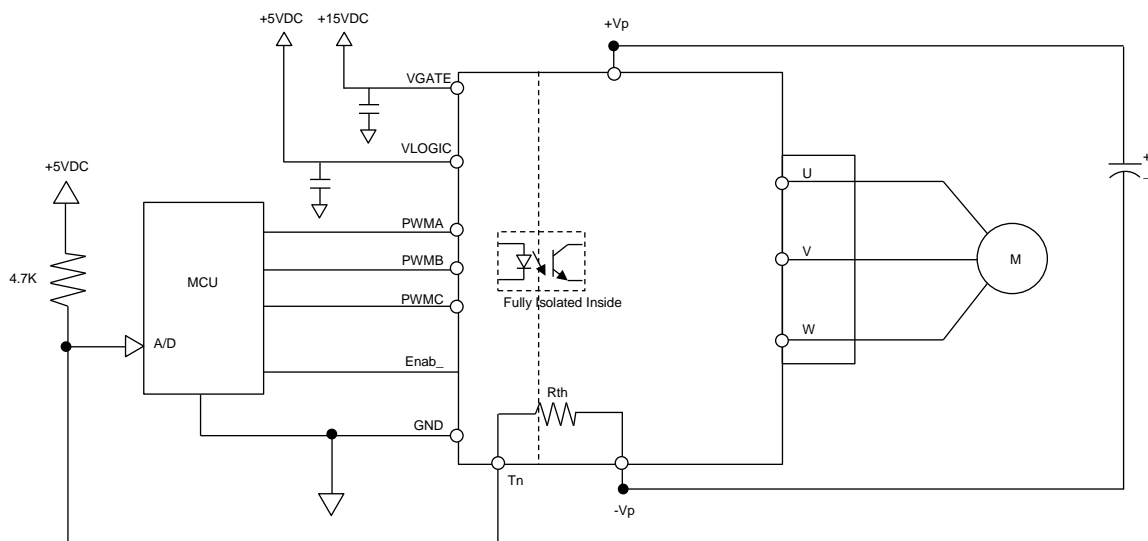
Power Side

Symbol	Parameter	Condition	Limits			Unit
			Min.	Typical	Max.	
VCE(Sat)	Collector, Emitter Saturation Voltage	Vgate = 15V	—	2	2.5	V
				Tj = 100°C	2.5	
ton	Switching time		—	0.6	0.8	μS
toff				0.6	0.8	
ICES	Collector off current		—	—	10	mA

Control Side

Symbol	Parameter	Condition	Limits			Unit
			Min.	Typical	Max.	
VGATE	Gate input voltage		12.0	15.0	18.0	V
IGATE	Gate input current		—	100.0	—	mA
VLOGIC	Control input voltage		4.75	5.0	5.25	V
ILOGIC	Control input current		—	50.0	—	mA
Enab_	All logic inputs	Logic high	3.0	5.0	5.25	V
PWMA		Logic low	-0.1	0.0	2.0	V

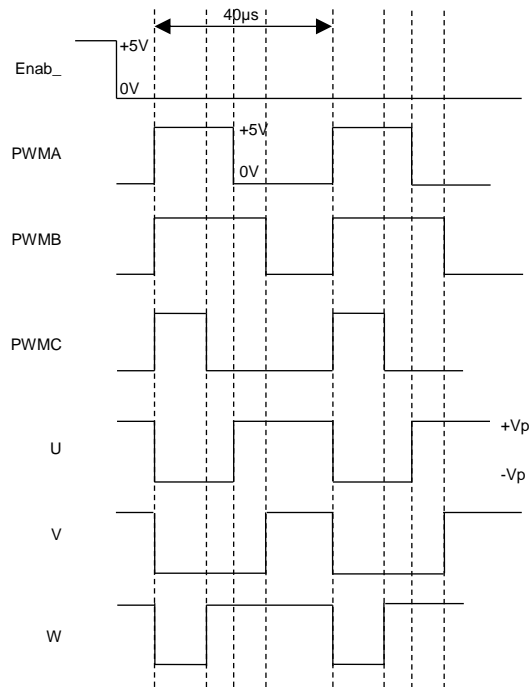
Application Circuit Example



Recommended Conditions for Use

Symbol	Parameter	Conditions	Recommended Value	Unit
VCE	Supply Voltage	Applied between +Vp and -Vp	≤ 500	V
IOUTPUT	Output Current	Current through U, V, W pins	≤ 25	A
VGATE	Gate Voltage	Applied between VGATE and GND	15	V
VLOGIC	Control Voltage	Applied between VLOGIC and GND	5	V
PWMA PWMB PWMC Enab_	Logic input levels	Applied between inputs and GND	0 or 5	V
PWM	Control input PWM	PWM input frequency	$\leq 30k$	Hz

Operating Waveform Example



Control Safety Circuit Example

