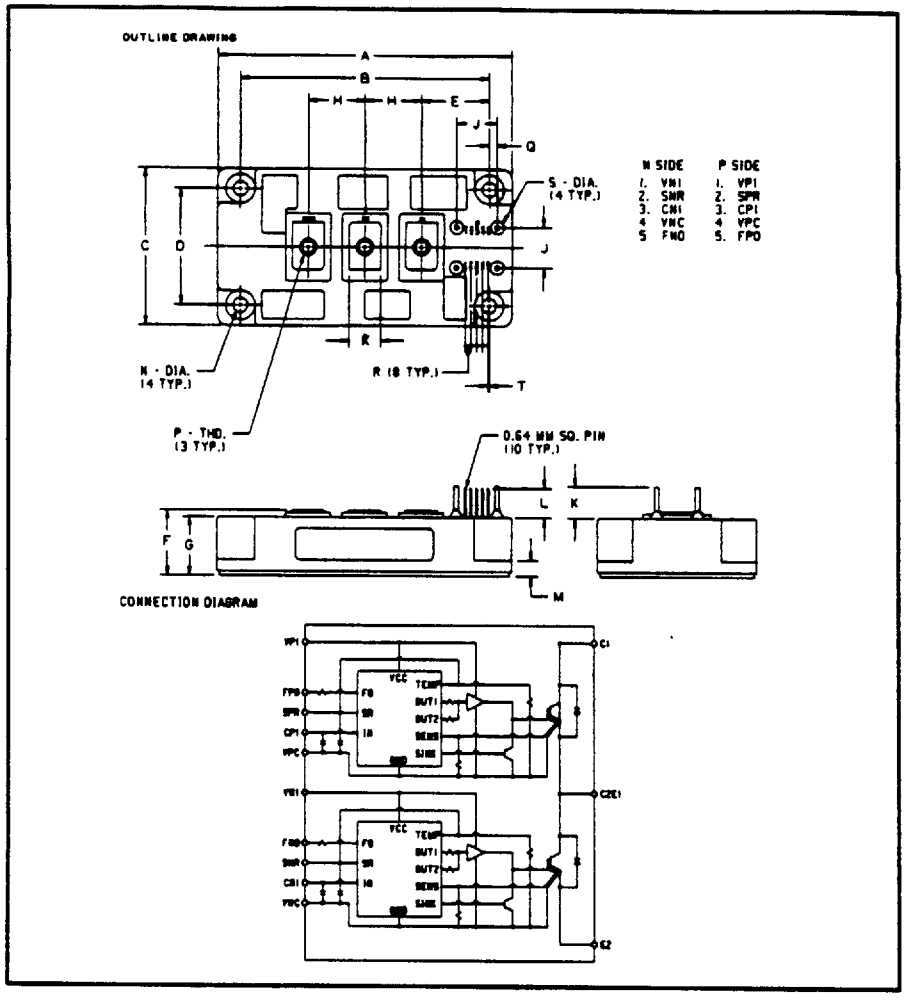
POWEREX

PM150DHA120

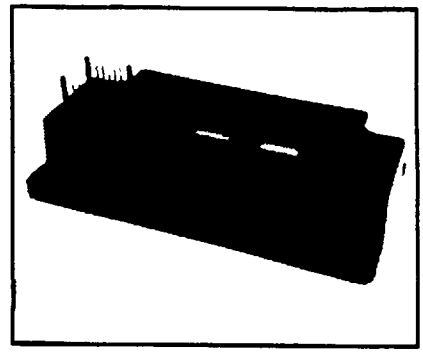
Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272
Powerex Europe, S.A., 428 Avenue G. Durand, BP107, 72003 Le Mans, France(43) 72.75.15



Outline Drawing

Dimensions	Inches	Millimeters
A	5.12	130.0
B	4.33±0.01	110.0±0.25
C	2.76	70.0
D	2.05±0.01	52.0±0.25
E	1.18	30.0
F	1.14+0.04/-0.02	29.0+1.0/-0.5
G	1.02	26.0
H	0.98	25.0
J	0.71	18.0

Dimensions	Inches	Millimeters
K	0.55	14.0
L	0.51	13.0
M	0.28	7.0
N	0.26 Dia.	6.5 Dia.
P	Metric M6	M6
Q	0.14	3.5
R	0.1	2.54
S	0.08 Dia.	2.0 Dia.
T	0.016	0.42



Description

Powerex Intellimod-3 Modules are designed for applications requiring a high frequency (20kHz) output switching inverter. The modules are isolated from the baseplate, consisting of complete drive, control and protection circuitry for the IGBT inverter.

Features:

- ☐ Complete Output Power Circuit
- ☐ Gate Drive Circuit
- ☐ Protection Logic
  - Short Circuit
  - Over-Current
  - Over Temperature
  - Under Voltage

Applications:

- ☐ Inverters
- ☐ Small UPS
- ☐ Motion/Servo Control
- ☐ AC Motor Control

A

POWEREX

PM150DHA120

Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272
Powerex Europe, S.A., 428 Avenue G. Durand, BP107, 72003 Le Mans, France(43) 72.75.15

PM150DHA120
Intellimod™-3
150 Amperes/1200 Volts

Absolute Maximum ratings, T_J=25 °C unless otherwise specified

Characteristics	Symbol	PM150DHA120	Units
Power Device Junction Temperature	T_J	-20 to 150	°C
Storage Temperature	T_{STG}	-40 to 125	°C
Case Operating Temperature	T_C	-20 to 100	°C
Mounting Torque, M6 Mounting Screws	---	26	Kg-cm
Mounting Torque, M6 Main Terminal Screws	---	26	Kg-cm
Module Weight (Typical)	---	630	Grams
Supply Voltage Protected by OC and SC (V_D=13.5 - 16.5 V, Inverter Part)	$V_{CC(prot)}$	800	Volts
Isolation Voltage AC 1 minute, 60Hz	V_{RMS}	2500	Volts
Control Sector			
Supply Voltage Applied Between (V_{P1}-V_{PC}, V_{N1}-V_{NC})	V_D	20	Volts
Input Voltage Applied Between (C_{P1}-V_{PC}, C_{N1}-V_{NC})	V_{CIN}	10	Volts
Fault Output Supply Voltage Applied Between (F_{PO}-V_{PC}, F_{NO}-V_{NC})	V_{FO}	20	Volts
Fault Output Current (Sink current at F_{PO},F_{NO} terminals)	I_{FO}	20	mA
IGBT Inverter Sector			
Collector-Emitter Voltage	V_{CES}	1200	Volts
Collector Current + -	I_C	150	Amperes
Peak Collector Current + -	I_{CP}	300	Amperes
Supply Voltage	V_{CC}	900	Volts
Supply Voltage (Surge)	$V_{CC(surge)}$	1000	Volts
Collector Dissipation	P_C	1140	Watts

PM150DHA120
Intellimod™-3
150 Amperes/1200 Volts

Electrical and Mechanical Characteristics, T_J=25°C unless otherwise specified

Characteristics	Symbol	Test Conditions	Min	Typ	Max	Units
Control Sector						
Over Current Trip Level	OC	-20°C≤T≤125°C Fig. 5	200	320	---	Amperes
Short Circuit Trip Level	SC	-20°C≤T≤125°C Fig. 5	280	450	---	Amperes
Over Current Delay Time	$t_{OFF(OC)}$	V_D=15V Fig. 5	---	5	---	µS
Over Temperature Protection	OT	Trip Level	100	110	120	°C
Over Temperature Protection	OT_R	Reset Level	85	95	105	°C
Supply Circuit Under Voltage Protection	UV	Trip Level	11.5	12.0	12 5	Volts
Supply Circuit Under Voltage Protection	UV_R	Reset Level	---	12.5	---	Volts
Supply Voltage	V_D	Applied between V_{UP1}-V_{UPC}, V_{N1}-V_{NC}	13.5	15	16.5	Volts
Circuit Current	I_D	V_D=15V, V_{CIN}=5V, V_{N1}-V_{NC}	---	19	26	mA
	I_D	V_D=15V, V_{CIN}=5V, V_{P1}-V_{PC}	---	19	26	mA
Input ON Voltage	$V_{CIN(ON)}$	Applied between C_{P1}-V_{PC}, C_{N1}-V_{NC}	1.2	1 5	1.8	Volts
Input Off Voltage	$V_{CIN(OFF)}$		1.7	2.0	2.3	Volts
PWM Input Frequency	f_{PWM}	3-ϕ Sinusoidal	---	15	20	kHz
Dead Time	t_{DEAD}	For each input pulse	4.0	---	---	µS
		Using app. circuit of Fig. 7, Optocoupler's input signal I_F=12mA	6.0	---	---	µS
Fault Output Current	$I_{FO(H)}$	V_D=15V, V_{FO}=15V	---	---	0.01	mA
	$I_{FO(L)}$	V_D=15V, V_{FO}=15V	---	10	15	mA
Minimum Fault Output Pulse Width	t_{FO}	V_D=15V	1 0	1.8	---	mS
SXR Terminal Output Voltage	V_{SXR}	T_J=125°C, R_{IN}=6.8kΩ,(S_{PR}, S_{NR})	4 5	5.1	5.6	Volts

PM150DHA120
Intellimod™-3
150 Amperes/1200 Volts

Electrical and Mechanical Characteristics, T_j=25°C unless otherwise specified

Characteristics	Symbol	Test Conditions	Min	Typ	Max	Units
IGBT Inverter Sector						
Collector Cutoff Current	I_{CES}	$V_{CE}=V_{CES}$, T_j=25°C,Fig.4	---	---	1	mA
Collector Cutoff Current	I_{CES}	$V_{CE}=V_{CES}$, T_j=125°C,Fig.4	---	---	10	mA
Diode Forward Voltage	V_{FM}	$-I_C$=150A, V_{CIN}=5V, Fig.2	---	1.8	3.0	Volts
Collector Emitter Saturation Voltage	$V_{CE(SAT)}$	V_D=15V,V_{CIN}=0V,I_C=150A, Fig.1	---	2.8	3.8	Volts
Collector Emitter Saturation Voltage	$V_{CE(SAT)}$	V_D=15V,V_{CIN}=0V,I_C=150A, T_j=125°C, Fig 1	---	2.4	3.4	Volts
Inductive Load Switching Times	t_{ON}	V_D=15V,V_{CIN}=0V	0.5	1 4	2.5	µS
	t_{RR}	V_{CC}=600V,I_C=150A	---	0.3	0.6	µS
	$t_{C(ON)}$	T_j=125°C	---	0.4	1.0	µS
	t_{OFF}	Fig. 3	---	3.5	4.0	µS
	$t_{C(OFF)}$		---	0.8	1.2	µS

Thermal Characteristics

Characteristic	Symbol	Condition	Min	Typ	Max	Units
Junction to Case Thermal Resistances	$R_{th(j-c)Q}$	Inverter IGBT part	---	---	0.11	°C/Watt
	$R_{th(j-c)F}$	Inverter FWD	---	---	0.24	°C/Watt
Contact Thermal Resistance	$R_{th(c-f)}$	Case to fin, thermal grease applied	---	---	0.075	°C/Watt

Recommended Conditions For Use

Characteristic	Symbol	Condition	Value	Unit
Supply Voltage	V_{CC}	Applied across C1-E2 terminals	0 ~ 800	Volts
	V_D	Applied between V_{P1}-V_{PC}, V_{N1}-V_{NC}	15 ± 1.5	Volts
Input ON Voltage	$V_{CIN(ON)}$	Applied between	0 ~ 0.8	mA
Input OFF Voltage	$V_{CIN(OFF)}$	C_{P1}-V_{PC}, C_{N1}-V_{NC}	4.0 ~ V_{SXR}	mA
PWM Input Frequency	f_{PWM}	Using application circuit of Fig 7	5 ~20	kHz
Minimum Dead Time	t_{DEAD}	Using application circuit of Fig 7 Opto-coupler's Input Signal	6.0	µS