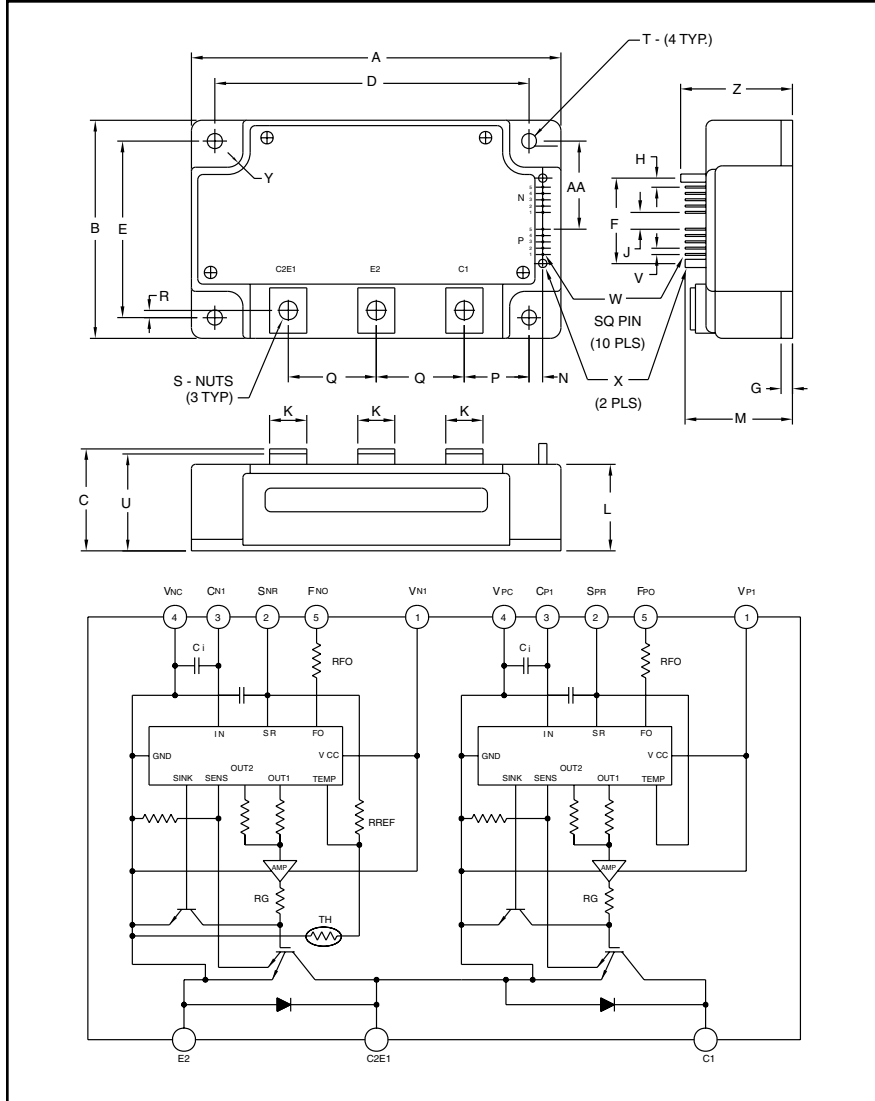


Intellimod™ Module

Single Phase

IGBT Inverter Output

600 Amperes/600 Volts



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	4.72	120.0
B	3.54	90.0
C	1.34 +0.04/-0.02	34 +1.0/-0.5
D	4.17±0.010	106.0±0.25
E	2.99±0.010	76.0±0.25
F	1.52	38.5
G	0.16	4.0
H	0.16	4.01
J	0.40	10.16
K	0.71	18.0
L	1.22	31.0
M	1.73	44.0
N	0.12	3.0

Dimensions	Inches	Millimeters
P	1.22	31.0
Q	1.10	28.0
R	0.12	3.0
S	M8 Metric	M8
T	0.26 Dia.	Dia. 6.5
U	1.29	32.8
V	0.10	2.54
W	0.025 SQ	0.64 SQ
X	0.14 Dia.	3.5 Dia.
Y	0.26 Dia.	Dia. 6.5
Z	1.79	45.5
AA	1.5	38.0



Description:

Powerex Intellimod™ Intelligent Power Modules are isolated base modules designed for power switching applications operating at frequencies to 20kHz. Built-in control circuits provide optimum gate drive and protection for the IGBT and free-wheel diode power devices.

Features:

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

Applications:

- Inverters
- UPS
- Motion/Servo Control
- Power Supplies

Ordering Information:

Example: Select the complete part number from the table below -i.e. PM600DVA060 is a 600V, 600 Ampere Intellimod™ Intelligent Power Module.

Type	Current Rating Amperes	V _{CES} Volts (x 10)
PM	600	60



Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (724) 925-7272

PM600DVA060
Intellimod™ Module
Single Phase IGBT Inverter Output
600 Amperes/600 Volts

Absolute Maximum Ratings, $T_j = 25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	PM600DVA060	Units
Power Device Junction Temperature	T_j	-20 to 150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 to 125	$^\circ\text{C}$
Case Operating Temperature	T_C	-20 to 100	$^\circ\text{C}$
Mounting Torque, M6 Mounting Screws (Typical)	—	26	in-lb
Mounting Torque, M8 Main Terminal Screws (Typical)	—	95	in-lb
Module Weight (Typical)	—	720	Grams
Supply Voltage (Applied between C1-E2)	$V_{CC(surge)}$	500	Volts
Supply Voltage Protected by SC ($V_D = 13.5 \sim 16.5\text{V}$, Inverter Part, $T_j = 125^\circ\text{C}$ Start)	$V_{CC(prot.)}$	400	Volts
Isolation Voltage, AC 1 minute, 60Hz Sinusoidal	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 ($C_{P1-V_{PC}}$, $V_{N1-V_{NC}}$)	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_O Terminals)	I_{FO}	20	mA

IGBT Inverter Sector

Collector-Emitter Voltage ($V_D = 15\text{V}$, $V_{CIN} = 5\text{V}$)	V_{CES}	600	Volts
Collector Current, \pm ($T_C = 25^\circ\text{C}$)	I_C	600	Amperes
Peak Collector Current, \pm ($T_C = 25^\circ\text{C}$)	I_{CP}	1200	Amperes
Collector Dissipation ($T_C = 25^\circ\text{C}$)	P_C	1260	Watts

Electrical and Mechanical Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Control Sector						
Short Circuit Trip Level	SC	$-20^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$, $V_D = 15\text{V}$	740	—	—	Amperes
Short Circuit Current Delay Time	$t_{off(SC)}$	$V_D = 15\text{V}$	—	10	—	μs
Over Temperature Protection	OT	Trip Level	111	118	125	$^\circ\text{C}$
($V_D = 15\text{V}$, Lower Arm)	OT_r	Reset Level	—	100	—	$^\circ\text{C}$
Supply Circuit Under Voltage Protection	UV	Trip Level	11.5	12.0	12.5	Volts
($-20^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)	UV_r	Reset Level	—	12.5	—	Volts
Circuit Current	I_D	$V_D = 15\text{V}$, $V_{CIN} = 5\text{V}$, $V_{N1-V_{NC}}$	—	27	38	mA
		$V_D = 15\text{V}$, $V_{CIN} = 5\text{V}$, $V_{P1-V_{PC}}$	—	27	38	mA
Input ON Threshold Voltage	$V_{CIN(on)}$	Applied between	1.2	1.5	1.8	Volts
Input OFF Threshold Voltage	$V_{CIN(off)}$	$C_{P1-V_{PC}}$, $C_{N1-V_{NC}}$	1.7	2.0	2.3	Volts
Fault Output Current	$I_{FO(H)}$	$V_D = 15\text{V}$, $V_{FO} = 15\text{V}$	—	—	0.01	mA
	$I_{FO(L)}$	$V_D = 15\text{V}$, $V_{FO} = 15\text{V}$	—	10	15	mA
Minimum Fault Output Pulse Width	t_{FO}	$V_D = 15\text{V}$	1.0	1.8	—	mS
SXR Terminal Output Voltage	V_{SXR}	$T_j \leq 125^\circ\text{C}$, $R_{in} = 6.8\text{k}\Omega$ (SPR , SNR)	4.5	5.1	5.6	Volts



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PM600DVA060
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Electrical and Mechanical Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
IGBT Inverter Sector						
Collector-Emitter Cutoff Current	I_{CES}	$V_{CE} = V_{CES}, V_D = 15\text{V}, T_j = 25^\circ\text{C}$	—	—	1.0	mA
		$V_{CE} = V_{CES}, V_D = 15\text{V}, T_j = 125^\circ\text{C}$	—	—	10.0	mA
FWDi Forward Voltage	V_{EC}	$-I_C = 600\text{A}, V_D = 15\text{V}, V_{CIN} = 5\text{V}$	—	2.20	3.30	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_D = 15\text{V}, V_{CIN} = 0\text{V}, I_C = 600\text{A},$ Pulsed, $T_j = 25^\circ\text{C}$	—	2.35	2.80	Volts
		$V_D = 15\text{V}, V_{CIN} = 0\text{V}, I_C = 600\text{A},$ Pulsed, $T_j = 125^\circ\text{C}$	—	2.55	3.05	Volts
Inductive Load Switching Times	t_{on}		0.4	0.8	2.1	μS
	t_{rr}	$V_D = 15\text{V}, V_{CIN} = 0\text{V} \sim 5\text{V}$	—	0.2	0.3	μS
	$t_{C(on)}$	$V_{CC} = 300\text{V}, I_C = 600\text{A},$ $T_j = 125^\circ\text{C}$	—	0.3	1.1	μS
	t_{off}		—	1.8	2.9	μS
	$t_{C(off)}$		—	0.6	1.2	μS

Thermal Characteristics

Characteristic	Symbol	Condition	Min.	Typ.	Max.	Units
Junction to Case Thermal Resistance	$R_{th(j-c)Q}$	Each Inverter IGBT	—	—	0.099	$^\circ\text{C/Watt}$
	$R_{th(j-c)D}$	Each Inverter FWDi	—	—	0.13	$^\circ\text{C/Watt}$
Contact Thermal Resistance	$R_{th(c-f)}$	Case to Fin Per Module, Thermal Grease Applied	—	—	0.065	$^\circ\text{C/Watt}$

Recommended Conditions for Use

Characteristic	Symbol	Condition	Value	Units
Supply Voltage	V_{CC}	Applied across C1-E2 Terminals	≤ 400	Volts
	$V_{CE(surge)}$	Applied across C1-E1, C2-E2 Terminals	≤ 500	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	≤ 0.8	Volts
Input OFF Voltage	$V_{CIN(off)}$	$C_{P1}-V_{PC}, C_{N1}-V_{NC}$	≥ 4.0	Volts
Arm Shoot-Through Blocking Time	t_{DEAD}	For IPM's each Input Signal	≥ 3.0	μS



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