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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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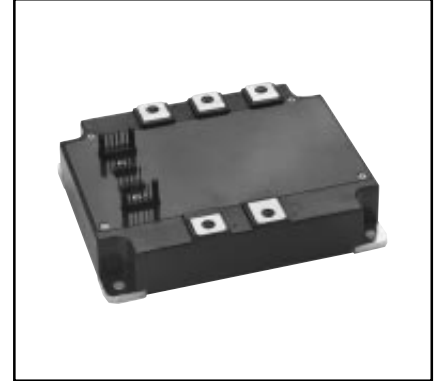
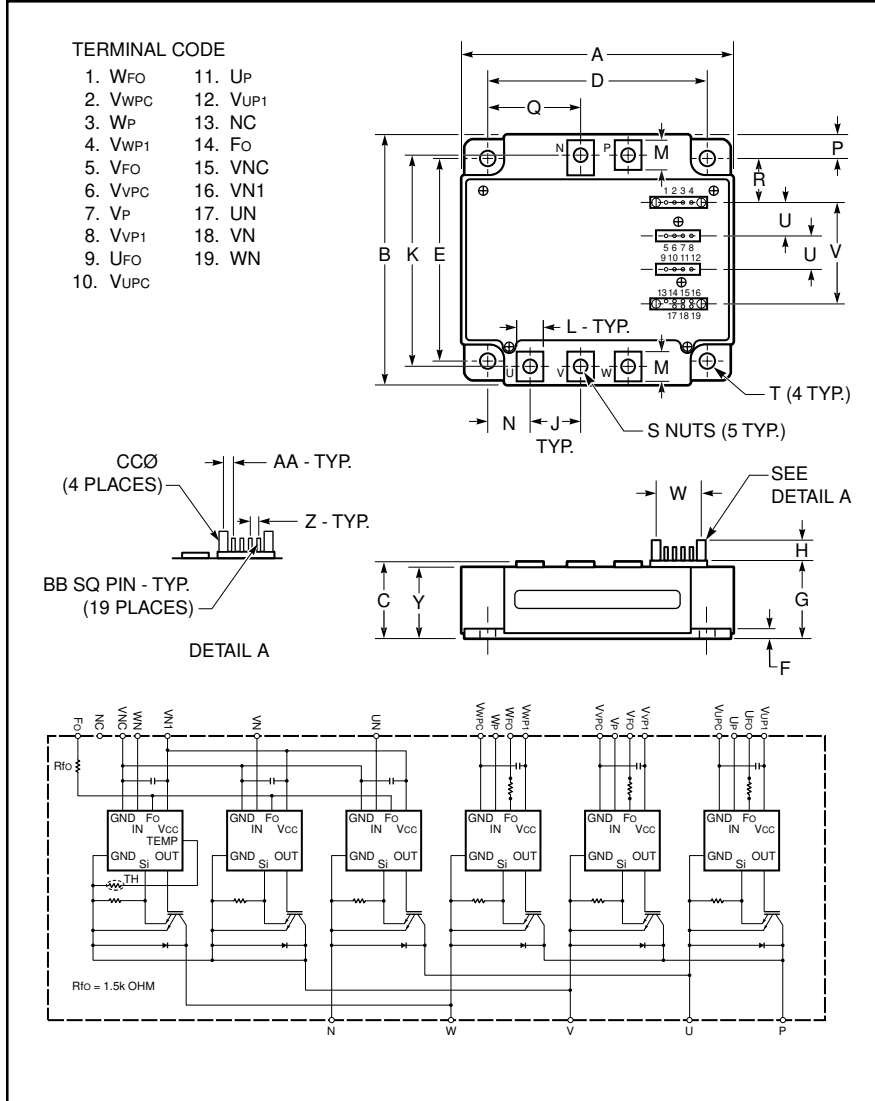
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### Intellimod™ Module

Three Phase  
IGBT Inverter Output  
300 Amperes/600 Volts



#### 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. PM300CVA060 is a 600V, 300 Ampere Intellimod™ Intelligent Power Module.

Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	5.31	135.0
B	4.33	110.0
C	1.14 +0.04/-0.02	29.0 +1.0/-0.5
D	4.74±0.010	120.5±0.25
E	3.76±0.010	95.5±0.25
F	0.16	4.0
G	1.14	29.0
H	0.41	10.4
J	1.10	28.0
K	3.82	97.0
L	0.55	14.0
M	0.59	15.0
N	0.88	22.25

Dimensions	Inches	Millimeters
P	0.29	7.25
Q	1.98	50.25
R	1.03	26.25
S	M5 Metric	M5
T	0.22 Dia.	Dia. 5.5
U	0.56±0.010	14.1±0.25
V	1.72±0.012	43.57±0.3
W	0.57±0.012	14.6±0.3
Y	1.04	26.5
Z	0.10±0.010	2.54±0.25
AA	0.137±0.010	3.49±0.25
BB	0.02 SQ	0.64 SQ
CC	0.12 +0.04/-0.02	3.0 +1.0/-0.5

Type	Current Rating Amperes	V <sub>CES</sub> Volts (x 10)
PM	300	60



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

**PM300CVA060**  
**Intellimod™ Module**  
**Three Phase IGBT Inverter Output**  
**300 Amperes/600 Volts**

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

Characteristics	Symbol	PM300CVA060	Units
Power Device Junction Temperature	$T_j$	-20 to 150	$^\circ\text{C}$
Storage Temperature	$T_{\text{stg}}$	-40 to 125	$^\circ\text{C}$
Case Operating Temperature	$T_C$	-20 to 100	$^\circ\text{C}$
Mounting Torque, M5 Mounting Screws (Typical)	—	17	in-lb
Mounting Torque, M5 Main Terminal Screws (Typical)	—	17	in-lb
Module Weight (Typical)	—	1000	Grams
Supply Voltage (Applied between P - N, Surge Value)	$V_{\text{CC(surge)}}$	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)	$V_{\text{CC(prot.)}}$	400	Volts
Isolation Voltage, AC 1 minute, 60Hz Sinusoidal	$V_{\text{RMS}}$	2500	Volts

**Control Sector**

Supply Voltage Applied between ( $V_{\text{UP1}}-V_{\text{UPC}}$ , $V_{\text{VP1}}-V_{\text{VPC}}$ , $V_{\text{WP1}}-V_{\text{WPC}}$ , $V_{\text{N1}}-V_{\text{NC}}$ )	$V_D$	20	Volts
Input Voltage Applied between ( $U_P$ , $V_P$ , $W_P$ , $U_N$ , $V_N$ , $W_N$ )	$V_{\text{CIN}}$	20	Volts
Fault Output Supply Voltage (Applied between $F_O-V_{\text{NC}}$ , $*F_O-V_{\text{PC}}$ )	$V_{\text{FO}}$	20	Volts
Fault Output Current (Sink Current at $F_O$ Terminals)	$I_{\text{FO}}$	20	mA

**IGBT Inverter Sector**

Collector-Emitter Voltage ( $V_D = 15\text{V}$ , $V_{\text{CIN}} = 15\text{V}$ )	$V_{\text{CES}}$	600	Volts
Collector Current, $\pm$ ( $T_C = 25^\circ\text{C}$ )	$I_C$	300	Amperes
Peak Collector Current, $\pm$ ( $T_C = 25^\circ\text{C}$ )	$I_{\text{CP}}$	600	Amperes
Collector Dissipation ( $T_C = 25^\circ\text{C}$ )	$P_C$	735	Watts



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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
<b>Control Sector</b>						
Short Circuit Trip Level	SC	$-20^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$ , $V_D = 15\text{V}$	396	—	—	Amperes
Short Circuit Current Delay Time	$t_{\text{off(SC)}}$	$V_D = 15\text{V}$	—	10	—	$\mu\text{S}$
Over Temperature Protection	OT	Trip Level	100	110	120	$^\circ\text{C}$
( $V_D = 15\text{V}$ )	$\text{OT}_r$	Reset Level	85	95	105	$^\circ\text{C}$
Supply Circuit Under Voltage Protection	UV	Trip Level	11.5	12.0	12.5	Volts
( $-20^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$ )	$\text{UV}_r$	Reset Level	—	12.5	—	Volts
Circuit Current	$I_D$	$V_D = 15\text{V}$ , $V_{\text{CIN}} = 15\text{V}$ , $V_{\text{N1}}-V_{\text{NC}}$	—	52	72	mA
		$V_D = 15\text{V}$ , $V_{\text{CIN}} = 15\text{V}$ , $V_{\text{XP1}}-V_{\text{XPC}}$	—	17	24	mA
Input ON Threshold Voltage	$V_{\text{CIN(on)}}$	Applied between $U_P-V_{\text{UPC}}$ , $V_P-V_{\text{VPC}}$ ,	1.2	1.5	1.8	Volts
Input OFF Threshold Voltage	$V_{\text{CIN(off)}}$	$W_P-V_{\text{WPC}}$ , $U_N$ , $V_N$ , $W_N-V_{\text{NC}}$	1.7	2.0	2.3	Volts
Fault Output Current	$I_{\text{FO(H)}}$	$V_D = 15\text{V}$ , $V_{\text{FO}} = 15\text{V}$	—	—	0.01	mA
	$I_{\text{FO(L)}}$	$V_D = 15\text{V}$ , $V_{\text{FO}} = 15\text{V}$	—	10	15	mA
Minimum Fault Output Pulse Width	$t_{\text{FO}}$	$V_D = 15\text{V}$	1.0	1.8	—	mS

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Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
<b>IGBT Inverter Sector</b>						
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	$V_{EC}$	$-I_C = 300\text{A}, V_D = 15\text{V}, V_{CIN} = 15\text{V}$	—	2.20	3.30	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_D = 15\text{V}, V_{CIN} = 0\text{V}, I_C = 300\text{A},$ Pulsed, $T_j = 25^\circ\text{C}$	—	2.35	2.80	Volts
		$V_D = 15\text{V}, V_{CIN} = 0\text{V}, I_C = 300\text{A},$ Pulsed, $T_j = 125^\circ\text{C}$	—	2.55	3.05	Volts
Inductive Load Switching Times (Upper-Lower Arm)	$t_{on}$		0.5	1.4	2.5	$\mu\text{S}$
	$t_{rr}$	$V_D = 15\text{V}, V_{CIN} = 0\text{V} \sim 15\text{V}$	—	0.15	0.30	$\mu\text{S}$
	$t_{C(on)}$	$V_{CC} = 300\text{V}, I_C = 300\text{A},$ $T_j = 125^\circ\text{C}$	—	0.4	1.0	$\mu\text{S}$
	$t_{off}$		—	2.0	3.0	$\mu\text{S}$
	$t_{C(off)}$		—	0.5	1.0	$\mu\text{S}$

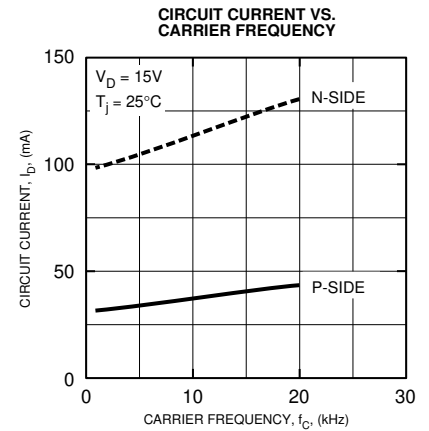
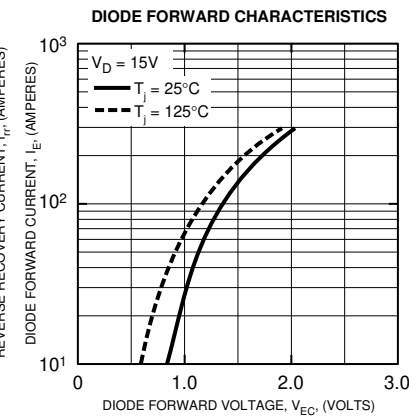
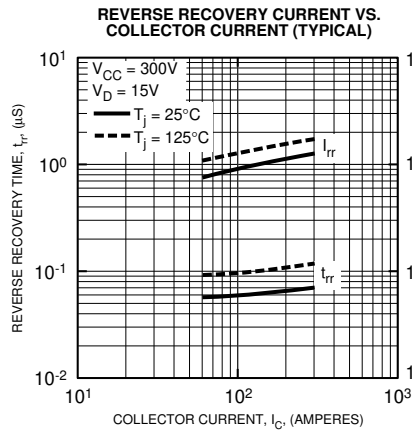
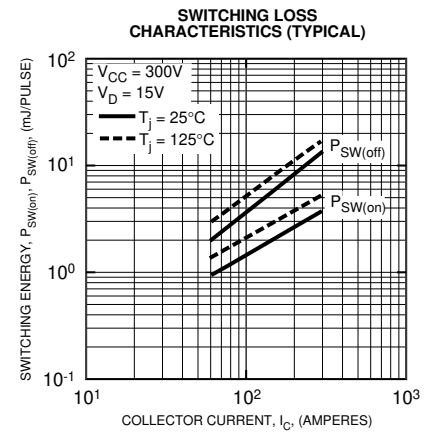
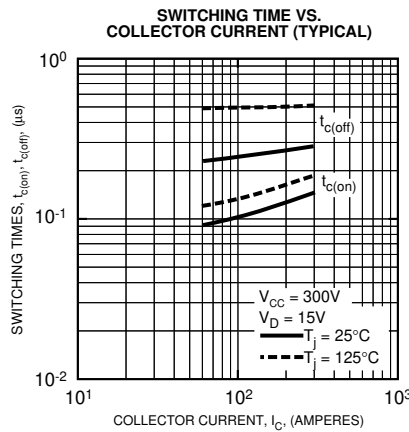
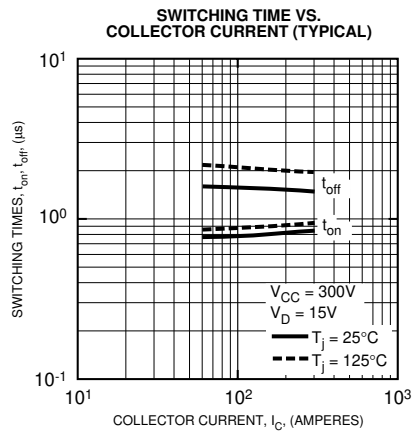
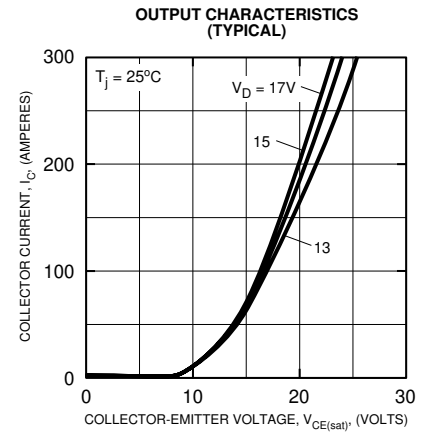
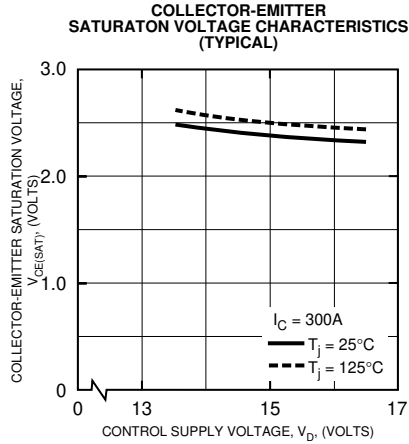
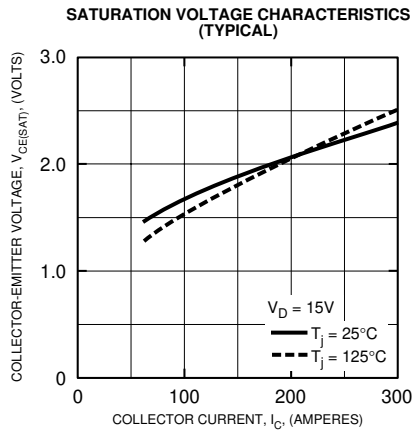
**Thermal Characteristics**

Characteristic	Symbol	Condition	Min.	Typ.	Max.	Units
Junction to Case Thermal Resistance	$R_{th(j-c)Q}$	Each Inverter IGBT	—	—	0.17	$^\circ\text{C/Watt}$
	$R_{th(j-c)D}$	Each Inverter FWDi	—	—	0.26	$^\circ\text{C/Watt}$
Contact Thermal Resistance	$R_{th(c-f)}$	Case to Fin Per Module, Thermal Grease Applied	—	—	0.018	$^\circ\text{C/Watt}$

**Recommended Conditions for Use**

Characteristic	Symbol	Condition	Value	Units
Supply Voltage	$V_{CC}$	Applied across P-N Terminals	$\leq 400$	Volts
	$V_{CE(surge)}$	Applied across Terminals P-U, P-V, P-W, U-N, V-N, W-N	$\leq 500$	Volts
	$V_D$	Applied between $V_{UP1}-V_{UPC},$ $V_{N1}-V_{NC}, V_{VP1}-V_{VPC}, V_{WP1}-V_{WPC}$	$15 \pm 1.5$	Volts
Input ON Voltage	$V_{CIN(on)}$	Applied between	$\leq 0.8$	Volts
Input OFF Voltage	$V_{CIN(off)}$	$U_P, V_P, W_P, U_N, V_N, W_N$	$\geq 4.0$	Volts
Arm Shoot-Through Blocking Time	$t_{DEAD}$	For IPM's each Input Signal	$\geq 2.5$	$\mu\text{S}$

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