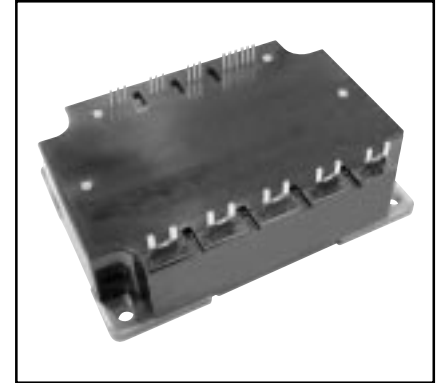
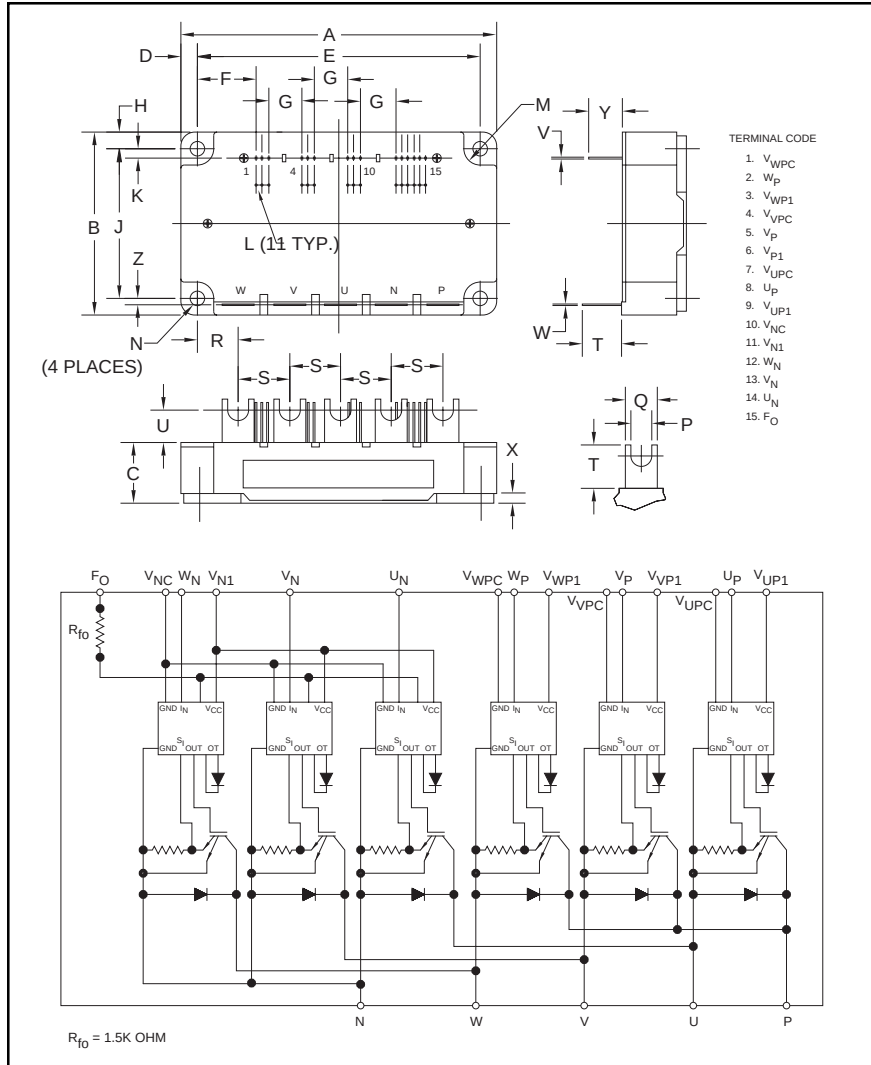


Intellimod™ Module MAXISS Series™ Multi AXIS Servo IPM 200 Amperes/600 Volts



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 Current
 - Under Voltage
 - Over Temperature by On-Chip Temperature Sensor
- ☐ Low Loss Using 4th Generation IGBT Chip

Applications:

- ☐ Motion Control
- ☐ Servo Control

Ordering Information:

Example: Select the complete part number from the table below -i.e. PM100CBS060 is a 600V, 100 Ampere Intellimod™ Intelligent Power Module.

Type	Current Rating Amperes	V_{CES} Volts (x 10)
PM	200	060

Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	4.72	120.0
B	3.35	85.0
C	1.18	30
D	0.3	7.0
E	4.17±0.1	106.0±0.3
F	0.94	23.79
G	0.40	10.16
H	0.28	7.0
J	2.80	71.0
K	0.16	4.0
L	0.10	2.54
M	0.28 Rad.	Rad. 7.0

Dimensions	Inches	Millimeters
N	5.5 Dia.	Dia. 5.5
P	0.20	5.0
Q	0.35	9.0
R	0.59	15.0
S	0.75	19.0
T	0.39	10.0
U	0.24	6.0
V	0.03	0.64
W	0.04	1.0
X	0.16	4.0
Y	0.35	9.0
Z	0.06	1.5

PM200CBS060

Intellimod™ Module

MAXISS Series™, Multi AXIS Servo IPM

200 Amperes/600 Volts

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

Characteristics	Symbol	PM200CBS060	Units
Storage Temperature	T_{stg}	-40 to 125	$^\circ\text{C}$
Case Operating Temperature*	T_C	-20 to 100	$^\circ\text{C}$
Mounting Torque, M5 Mounting Screws	—	31	in-lb
Mounting Torque, M5 Main Terminal Screws	—	31	in-lb
Module Weight (Typical)	—	680	Grams
Supply Voltage Protected by OC and SC ($V_D = 13.5 - 16.5\text{V}$, Inverter Part, $T_j = 125^\circ\text{C}$)	$V_{\text{CC(prot.)}}$	400	Volts
Supply Voltage, Surge (Applied between P - N)	$V_{\text{CC(surge)}}$	500	Volts
Isolation Voltage, AC 1 minute, 60Hz Sinusoidal	V_{ISO}	2500	V_{rms}

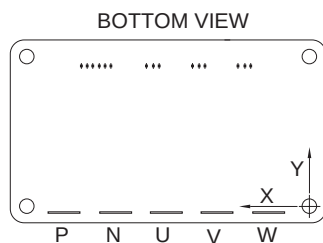
IGBT Inverter Sector

Collector-Emitter Voltage ($V_D = 15\text{V}$, $V_{\text{CIN}} = 15\text{V}$)	V_{CES}	600	Volts
Collector Current, $\pm$ ($T_C = 25^\circ\text{C}$)	I_C	200	Amperes
Peak Collector Current, $\pm$ ($T_C = 25^\circ\text{C}$)	I_{CP}	400	Amperes
Collector Dissipation	P_C	961	Watts
Power Device Junction Temperature	T_j	-20 to 150	$^\circ\text{C}$

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_{UPC} , V_P-V_{VPC} , W_P-V_{WPC} , U_N-V_{NC} , W_N-V_{NC})	V_{CIN}	20	Volts
Fault Output Supply Voltage (Applied between F_O and V_{NC})	V_{FO}	$V_D + 0.5$	Volts
Fault Output Current (Sink Current at F_O Terminal)	I_{FO}	20	mA

* T_C Measure Point (Under the Chip)



(mm)

ARM AXIS	U_P		V_P		W_P		U_N		V_N		W_N	
	IGBT	FWDi	IGBT	FWDi	IGBT	FWDi	IGBT	FWDi	IGBT	FWDi	IGBT	FWDi
X	84.5	84.5	53.0	53.0	21.5	21.5	92.9	81.1	56.2	44.4	13.2	24.9
Y	57.5	45.8	57.5	45.8	57.5	45.8	22.3	22.3	22.3	22.3	22.3	22.3

PM200CBS060
Intellimod™ Module
MAXISS Series™, Multi AXIS Servo IPM
 200 Amperes/600 Volts

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 = 15V, T _j = 25°C	—	—	1.0	mA
		V _{CE} = V _{CES} , V _D = 15V, T _j = 125°C	—	—	10	mA
Diode Forward Voltage	V _{EC}	-I _C = 200A, V _D = 15V, V _{CIN} = 15V	—	2.2	3.3	Volts
Collector-Emitter Saturation Voltage	V _{CE(sat)}	V _D = 15V, V _{CIN} = 0V, I _C = 200A, T _j = 25°C	—	1.7	2.3	Volts
		V _D = 15V, V _{CIN} = 0V, I _C = 200A, T _j = 125°C	—	1.7	2.3	Volts
Inductive Load Switching Times	t _{on}	V _D = 15V, V _{CIN} = 0 ~ 15V, V _{CC} = 300V, I _C = 200A, T _j = 125°C, Inductive Load	0.8	1.2	2.4	μS
	t _{rr}		—	0.15	0.3	μS
	t _{C(on)}		—	0.4	1.0	μS
	t _{off}		—	2.4	3.3	μS
	t _{C(off)}		—	0.5	1.0	μS
Control Sector						
Over Current Trip Level	OC	T _j = -20°C, V _D = 15V	—	—	810	Amperes
		T _j = 25°C, V _D = 15V	400	515	670	Amperes
		T _j = 125°C, V _D = 15V	310	—	—	Amperes
Short Circuit Trip Level	SC	-20°C ≤ T _j ≤ 125°C, V _D = 15V	—	560	—	Amperes
Over Current Delay Time	t _{off(OC)}	V _D = 15V	—	10	—	μS
Over Temperature Protection	OT	Trip Level	135	145	155	°C
(Detect T _j of IGBT Chip)	OT _R	Reset Level	—	125	—	°C
Supply Circuit Under Voltage Protection	UV	Trip Level	11.5	12.0	12.5	Volts
(-20 ≤ T _j ≤ 125°C)	UV _R	Reset Level	—	12.5	—	Volts
Circuit Current	I _D	V _D = 15V, V _{CIN} = 15V, V _{N1} -V _{NC}	—	45	65	mA
		V _D = 15V, V _{CIN} = 15V, V _{XP1} -V _{XPC}	—	15	20	mA
Input ON Threshold Voltage	V _{th(on)}	Applied between U _P -V _{UPC} , V _P -V _{VPC} ,	1.2	1.5	1.8	Volts
Input OFF Threshold Voltage	V _{th(off)}	W _P -V _{WPC} , U _N , V _N , W _N -V _{NC}	1.7	2.0	2.3	Volts
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



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

PM200CBS060

Intellimod™ Module

MAXISS Series™, Multi AXIS Servo IPM

200 Amperes/600 Volts

Thermal Characteristics

Characteristic	Symbol	Condition	Min.	Typ.	Max.	Units
Junction to Case Thermal Resistance	$R_{th(j-c)Q}$	Each IGBT*	—	—	0.13**	°C/Watt
	$R_{th(j-c)F}$	Each FWDi*	—	—	0.21**	°C/Watt
Contact Thermal Resistance	$R_{th(c-f)}$	Case to Fin Per Module, Thermal Grease Applied	—	—	0.025	°C/Watt

*T_C measured point is just under the chips.

**If you use this value, R_{th(f-a)} should be measured just under the chips.

Recommended Conditions for Use

Characteristic	Symbol	Condition	Value	Units
Supply Voltage	V _{CC}	Applied across P-N Terminals	≤ 400	Volts
Control Supply Voltage***	V _D	Applied between V _{UP1} -V _{UPC} , V _{VP1} -V _{VPC} , V _{WP1} -V _{WPC} , V _{N1} -V _{NC}	15 ± 1.5	Volts
Input ON Voltage	V _{CIN(on)}	Applied between U _P -V _{UPC} , V _P -V _{VPC} ,	≤ 0.8	Volts
Input OFF Voltage	V _{CIN(off)}	W _P -V _{WPC} , U _N , V _N , W _N -V _{NC}	≥ 4.0	Volts
PWM Input Frequency	f _{PWM}	Using Application Circuit	≤ 20	kHz
Minimum Dead Time	t _{DEAD}	Input Signal	≥ 2.5	μS

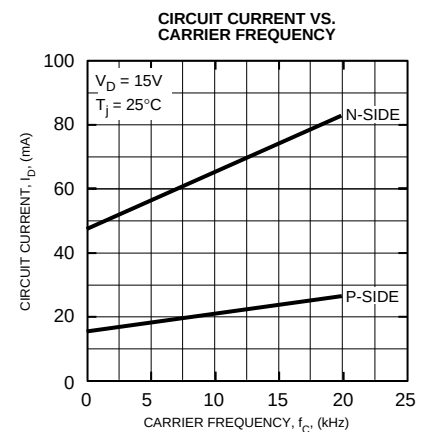
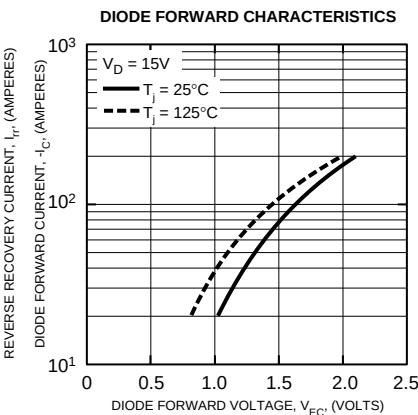
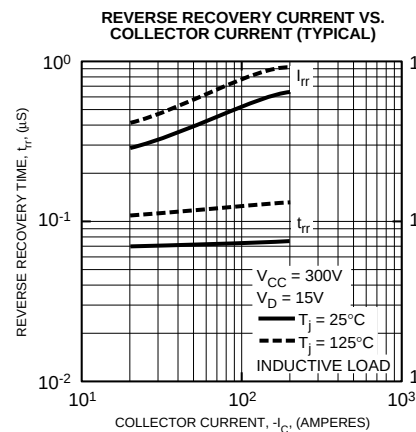
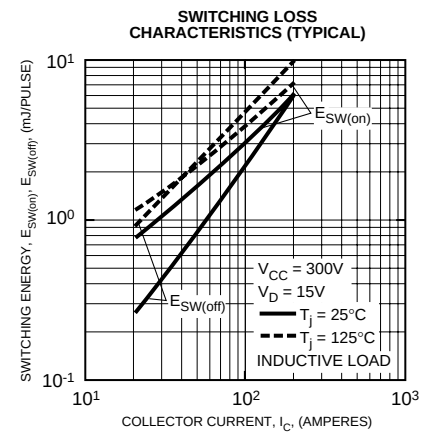
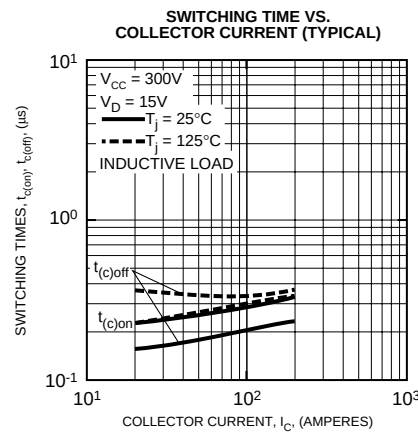
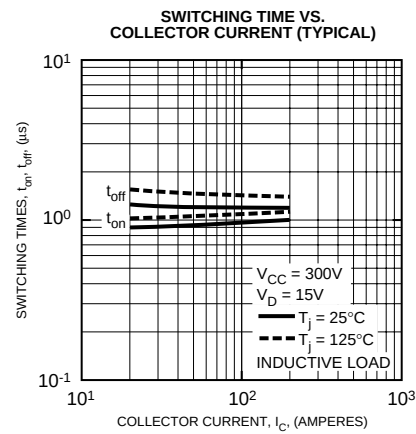
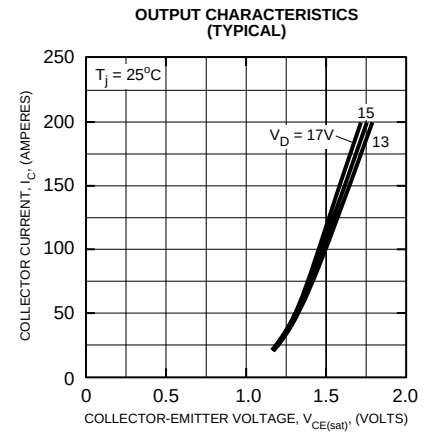
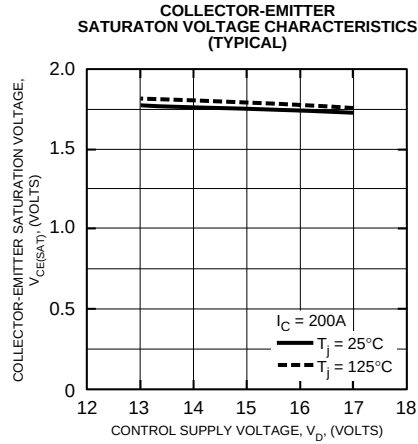
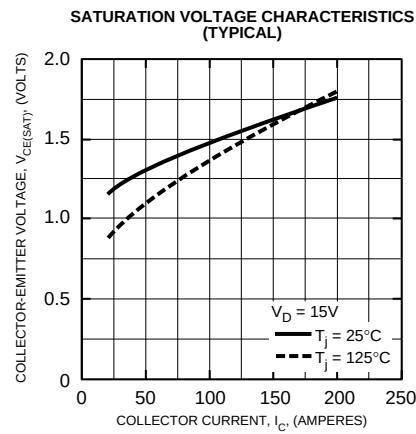
***With ripple satisfying the following conditions: dv/dt ≤ ±5v/μs, Variation ≤ 2V peak to peak.

PM200CBS060

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