



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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!



Contact us

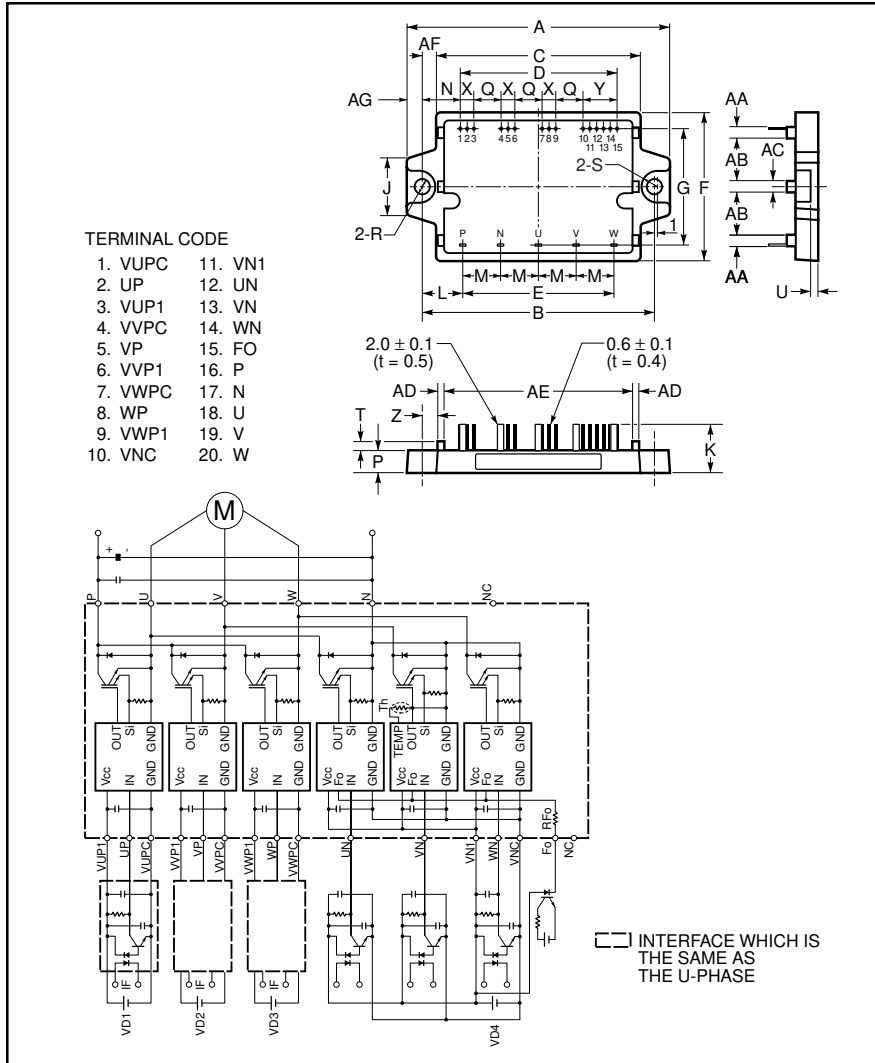
Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



Intellimod™ Modules Three Phase Converter IGBT Inverter Output 15 Amperes/1200 Volt



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
 - 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. PM15CZF120 is a 1200V, 15 Ampere Intellimod™ Intelligent Power Module.

Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	3.86±0.04	98.0±1.0
B	3.43±0.02	87.0±0.5
C	2.99	76.0
D	2.30	58.42
E	2.20±0.03	56.0±0.8
F	2.21±0.04	56.0±1.0
G	1.73±0.03	44.0±0.8
J	0.83	21.0
K	0.71±0.04	18.0±1.0
L	0.61	15.5
M	0.55±0.01	14.0±0.3
N	0.56	14.29
P	0.32±0.02	8.0±0.5
Q	0.40	10.16

Dimensions	Inches	Millimeters
R	0.22 Dia.	5.5 Dia.
S	0.24 Rad.	6.0 Rad.
T	0.14	3.5
U	0.12±0.02	3.0±0.5
X	0.1±0.01	2.54±0.3
Y	0.1±0.01	2.54±0.3
Z	0.24	6.0
AA	0.12	3.0
AB	0.69	17.5
AC	0.16	4.0
AD	0.10	2.5
AE	2.76	70.0
AF	0.22	5.5
AG	0.22	5.5

Type	Current Rating Amperes	V _{CES} Volts (x 10)
PM	15	120



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

PM15CZF120
Intellimod™ Modules
Three Phase Converter IGBT Inverter Output
15 Amperes/1200 Volts

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

Characteristics	Symbol	PM15CZF120	Units
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 M5 Mounting Screws	-	17	in-lb
Module Weight (Typical)	-	80	Grams
Supply Voltage Protected by OC and SC ($V_D = 13.5 \sim 16.5\text{V}$, Inverter Part)	$V_{CC(prot)}$	800	Volts
Isolation Voltage, AC 1 minute, 60Hz Sinusoidal	V_{RMS}	2500	Volts

Control Sector

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

IGBT Inverter Sector

Collector-Emitter Voltage ($V_D = 15\text{V}$, $V_{CIN} = 15\text{V}$)	V_{CES}	1200	Volts
Collector Current, \pm	I_C	15	Amperes
Peak Collector Current, \pm	I_{CP}	30	Amperes
Supply Voltage (Applied between P-N)	V_{CC}	900	Volts
Supply Voltage, Surge (Applied between P-N, Surge Value)	$V_{CC(surge)}$	1000	Volts
Collector Dissipation	P_C	83	Watts



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

PM15CZF120
Intellimod™ Modules
Three Phase Converter IGBT Inverter Output
15 Amperes/1200 Volts

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

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Control Sector						
Over Current Trip Level	OC	$-20^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$, $V_D = 15\text{V}$	22	37	–	Amperes
Short Circuit Trip Level	SC	$-20^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$, $V_D = 15\text{V}$	–	56	–	Amperes
Over Current Delay Time	$t_{\text{off}}(\text{OC})$	$V_D = 15\text{V}$	–	10	–	μS
Over Temperature Protection	OT	Trip Level	100	110	120	$^\circ\text{C}$
	OT_R	Reset Level	–	90	–	$^\circ\text{C}$
Supply Circuit Under Voltage Protection	UV	Trip Level	11.5	12.0	12.5	Volts
	UV_R	Reset Level	–	12.5	–	Volts
Supply Voltage	V_D	Applied between $V_{\text{UP}1}\text{-}V_{\text{UPC}}$, $V_{\text{VP}1}\text{-}V_{\text{VPC}}$, $V_{\text{WP}1}\text{-}V_{\text{WPC}}$, $V_{\text{N}1}\text{-}V_{\text{NC}}$	13.5	15.0	16.5	Volts
Circuit Current	I_D	$V_D = 15\text{V}$, $V_{\text{CIN}} = 15\text{V}$, $V_{\text{N}1}\text{-}V_{\text{NC}}$	–	18	25	mA
		$V_D = 15\text{V}$, $V_{\text{CIN}} = 15\text{V}$, $V_{\text{XP}1}\text{-}V_{\text{XPC}}$	–	7	10	mA
Input ON Threshold Voltage	$V_{\text{CIN}(\text{on})}$	Applied between	1.2	1.5	1.8	Volts
Input OFF Threshold Voltage	$V_{\text{CIN}(\text{off})}$	U_P , V_P , W_P , U_N , V_N , W_N	1.7	2.0	2.3	Volts
PWM Input Frequency	f_{PWM}	3- \emptyset Sinusoidal	–	15	20	kHz
Fault Output Current	$I_{\text{FO}(\text{H})}$	$V_D = 15\text{V}$, $V_{\text{FO}} = 15\text{V}$	–	–	0.01	mA
	$I_{\text{FO}(\text{L})}$	$V_D = 15\text{V}$, $V_{\text{FO}} = 15\text{V}$	–	10	15	mA
Minimum Fault Output Pulse Width	t_{FO}	$V_D = 15\text{V}$	1.0	1.8	–	mS

PM15CZF120
Intellimod™ Modules
Three Phase Converter IGBT Inverter Output
15 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-Emitter Cutoff Current	I _{CES}	V _{CE} = V _{CES} , V _D = 15V, T _j = 25°C	–	–	1	mA
		V _{CE} = V _{CES} , V _D = 15V, T _j = 125°C	–	–	10	mA
FwDi Forward Voltage	V _{EC}	-I _C = 15A, V _D = 15V, V _{CIN} = 15V	–	2.5	3.5	Volts
Collector-Emitter Saturation Voltage	V _{CE(sat)}	V _D = 15V, V _{CIN} = 0V, I _C = 15A, T _j = 25°C	–	2.7	3.7	Volts
		V _D = 15V, V _{CIN} = 0V, I _C = 15A, T _j = 125°C	–	2.5	3.4	Volts
Inductive Load Switching Times	t _{on}		0.3	0.6	1.3	μS
	t _{rr}	V _D = 15V, V _{CIN} = 0 ~ 15V,	–	0.15	–	μS
	t _{C(on)}	V _{CC} = 600V, I _C = 15A,	–	0.3	1.0	μS
	t _{off}	T _j = 125°C, Inductive Load	–	1.8	3.3	μS
	t _{C(off)}		–	0.8	1.5	μS

Thermal Characteristics

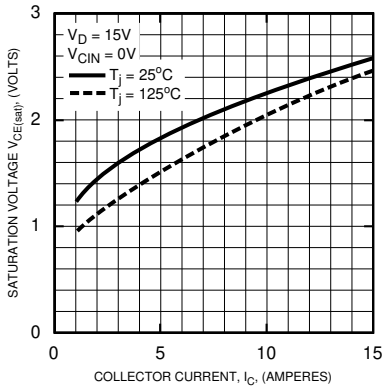
Characteristic	Symbol	Condition	Min.	Typ.	Max.	Units
Junction to Case Thermal Resistance	R _{th(j-c)Q}	Each IGBT	–	–	1.5	°C/Watt
	R _{th(j-c)D}	Each FwDi	–	–	4.5	°C/Watt
Contact Thermal Resistance	R _{th(c-f)}	Case to Fin Per Module, Thermal Grease Applied	–	–	0.067	°C/Watt

Recommended Conditions for Use

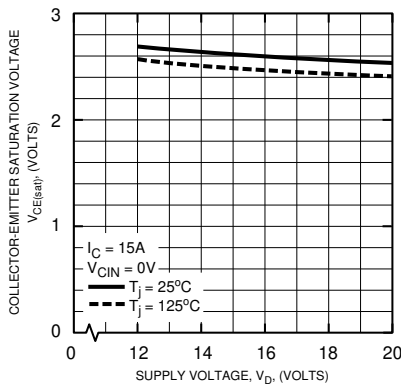
Characteristic	Symbol	Condition	Value	Units
Supply Voltage	V _{CC}	Applied across P-N Terminals	0 ~ 800	Volts
	V _D	Applied between V _{UP1} -V _{UPC} , V _{N1} -V _{NC} , V _{VP1} -V _{VPC} , V _{WP1} -V _{WPC}	15 ± 1.5	Volts
Input ON Voltage	V _{CIN(on)}	Applied between	0 ~ 0.8	Volts
Input OFF Voltage	V _{CIN(off)}	U _P , V _P , W _P , U _N , V _N , W _N	4.0 ~ V _D	Volts
PWM Input Frequency	f _{PWM}	Using Application Circuit	5 ~ 20	kHz
Minimum Dead Time	t _{DEAD}	Input Signal	≥3.0	μS

PM15CZF120
Intellimod™ Modules
Three Phase Converter IGBT Inverter Output
15 Amperes/1200 Volts

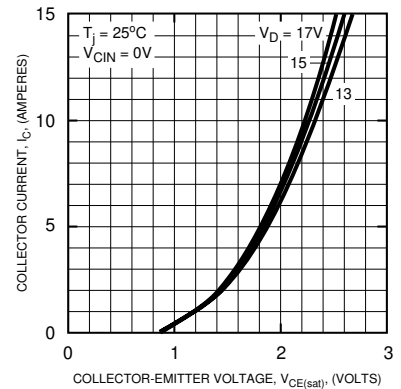
SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)



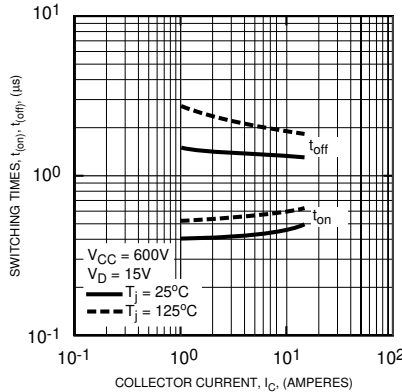
COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)



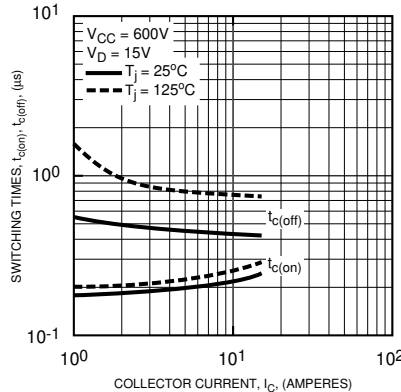
OUTPUT CHARACTERISTICS (TYPICAL)



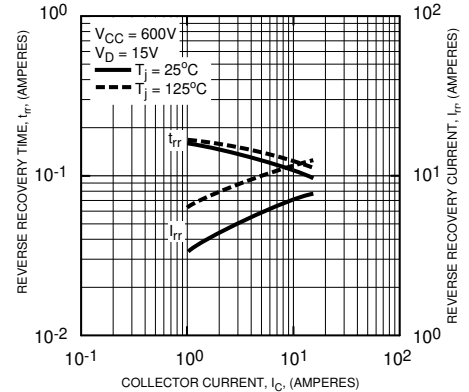
SWITCHING TIME VS. COLLECTOR CURRENT (TYPICAL)



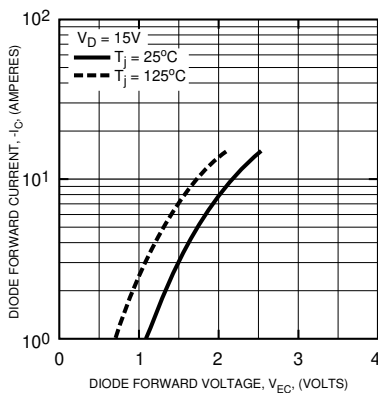
SWITCHING TIME VS. COLLECTOR CURRENT (TYPICAL)



REVERSE RECOVERY CURRENT VS. COLLECTOR CURRENT (TYPICAL)



FREE-WHEEL DIODE FORWARD CHARACTERISTICS (TYPICAL)





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

PM15CZF120
Intellimod™ Modules
Three Phase Converter IGBT Inverter Output
15 Amperes/1200 Volts

