

## Description

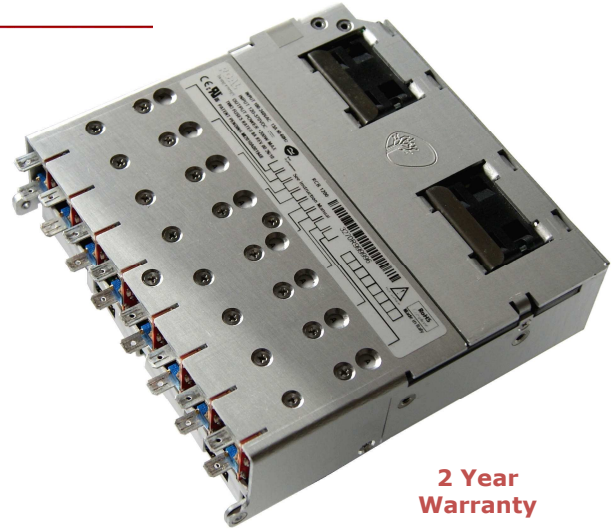
The RCB1200 is a modular, user configurable power supply offering unrivalled performances and flexibility.

Providing up to 1200 W from a 1300 g, 6.09" x 6.05" x 1U package, the RCB1200 offer the highest power density for a configurable power solution.

Each unit consists of two input modules twins and an output section configurable with up to 8 isolated output modules. Two built in and speed controlled fans ensure proper cooling while maintaining minimal noise and enhancing lifetime.

The output modules are available in four standard voltages widely adjustable, and are capable to operate in series and parallel mode.

The series carry full UL60950 safety approvals and comply with EN61000-3, EN61000-4 and EN55022 class B EMC standards.



**2 Year  
Warranty**

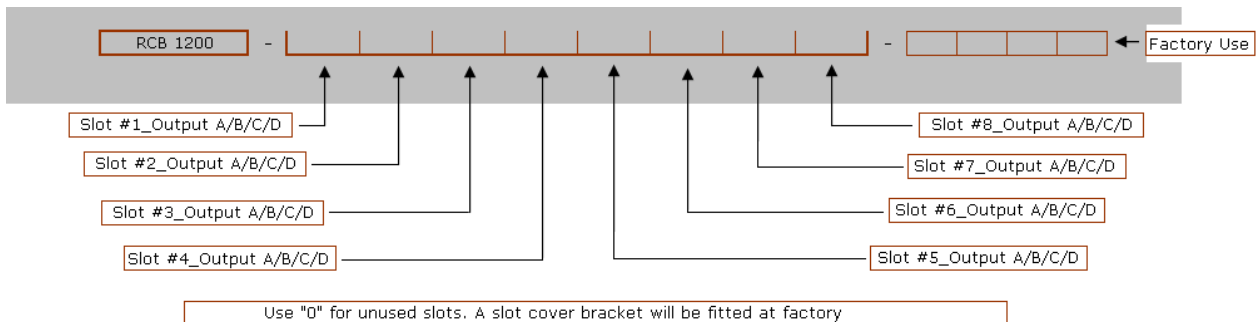
## KEY FEATURES

- Universal input voltage
- Active power factor correction
- High power density (>20 W/in<sup>3</sup>)
- 1200W output in 6.09"x 6.05" footprint, 1U height
- Field configurable
- High reliability, high efficiency
- Fans speed controlled
- No line de-rating above 120 V<sub>AC</sub>
- Parallel operation
- Accurate wired current share
- Current output signal
- Remote voltage/current programming
- Fan controlled speed – reduced noise
- N+1 redundant (external diodes)
- 2X Global +5 V, 200 mA bias supply
- RoHS-6 compliant

## MARKET SEGMENTS AND APPLICATIONS

- Industrial Electronics and Computers
- Test and Measurement Equipment
- Automation and Drives
- Printing
- Industrial & Process Controls
- Telecommunications

## MODELS AND ORDERING INFORMATION



The factory might issue a 4 digit code for a specific configuration which can be used for next and future orders of the same configuration. When ordering an input unit with no outputs inserted, simply order RCB 1200.

Output Module	Nominal Voltage	Rated Current	Voltage Adjustment	Load Regulation	Line Regulation	OVP	Output Power
<b>A</b>	5 V	25.0 A	1.5 to 7.5 V	±50 mV	±0.1 %V <sub>NOM</sub>	9.5 V	125 W
<b>B</b>	12 V	15.0 A	4.5 to 15 V	±100 mV	±0.1 %V <sub>NOM</sub>	18 V	150 W
<b>C</b>	24 V	7.5 A	9 to 30 V	±150 mV	±0.1 %V <sub>NOM</sub>	36 V	150 W
<b>D</b>	48 V	3.75 A	18 to 58 V	±300 mV	±0.1 %V <sub>NOM</sub>	66 V	150 W
<b>0 (zero)</b>				Unused slots			

## Input Specifications

Parameter	Details	Min	Typ	Max	Units
AC input voltage	Nominal range is 100 to 240 V <sub>RMS</sub>	85		264	V <sub>RMS</sub>
AC input frequency		47	50/60	63	Hz
DC input voltage		120		370	V <sub>DC</sub>
Power rating	Subjected to input line voltage and temperature de-ratings. See graphs below.			1200	W
Input current	At 1200 W output and 120 V <sub>RMS</sub> input			12	A
Inrush current	264 V <sub>RMS</sub> , 25 °C cold start, 75° phase			40	A
Fusing	5x20 fast acting fuse on each input module live conductor			8	A
Input current limit	Maintains power factor		16		A
Efficiency	Configuration, load, input voltage dependent.		86	89	%
Idle power	All outputs fitted and enabled		56		W
	All outputs fitted and disabled		42		
Power factor	Typical value at 1200 W output at 240 V <sub>RMS</sub>		0.96	0.99	
Hold up	1200 W output at 120 V <sub>RMS</sub> input	17	20	21	ms
UVLO	Turn on only	78		84	V <sub>RMS</sub>
Over temperature	Internally monitored. Latching	115		125	°C
Reliability	At 40 °C, 80% load			4	FPMH

## Signals

Parameter	Details	Min	Typ	Max	Units
Bias voltage	Available on both back panel signal connectors	4.8	5	5.2	V
Bias current	Available on both back panel signal connectors	0		200	mA
Power Good Voltage	PNP open collector with internal 10 KΩ pull down resistor	8	10	15	V
Power Good Current		0		20	mA
Inhibit voltage		2		15	V
Inhibit current	10 KΩ input impedance	0.2		1.5	mA
Global inhibit voltage		3		15	V
Global inhibit current	5 KΩ input impedance	0.6		3	mA
AC_OK voltage		1		4	V
AC_OK current		-10		20	mA
AC_OK warning	See user manual for exceptions	5			ms

## Safety

Parameter	Details	Min	Max	Units
Isolation voltage	Input to Output		4000	V <sub>AC</sub>
	Input to Chassis		1500	V <sub>AC</sub>
	Output to Chassis		250	V <sub>DC</sub>
	Output to Output		250	V <sub>DC</sub>
Isolation clearance	Primary to Secondary (Reinforced)	7		mm
	Primary to Chassis (Basic)	2.5		mm
Isolation creepage	Primary to Secondary (Reinforced)	12		mm
	Primary to Chassis (Basic)	4		mm
Leakage current	265 V <sub>AC</sub> , 63 Hz, 25°C		1500	µA
Agency Approvals Standards	cURUS, Demko, CB Certificate IEC/EN60950-1; UL60950-1/CSAC22.2No.60950-1-03; CE Mark: LVD 73/23/EEC.			
Agency File Numbers	UL file: E134098 Demko Certificate: 152969-02 CB Test Certificate: DK-21001			

## Environmental

Parameter	Details	Min	Max	Units
<b>Storage</b>				
Temperature		-40	+85	°C
Humidity	Relative, non condensing	5	95	%
Altitude		-200	5000	m
Air pressure		54	106	kPa
<b>Operating</b>				
Temperature	Full power	-20	50	°C
	Input and Output Modules de-rate by 2.5%/°C above 50°C.	50	70	°C
Humidity	Relative, non condensing	5	95	%
Altitude		-200	4600	m
Air pressure		78	106	KPa
Noise level	It depends on fans speed, which is determined by input line voltage, required output power and ambient temperature.	TBM	TBM	dB(A)
Shock	3000 bumps at 10 g (16 ms) half sine wave			
Vibration	1,5 g 10 to 200 Hz sine wave, 20 g for 15 min in 3 axes random vibration			
<b>Installation</b>				
Equipment class	I			
Installation category	II			
Pollution Degree	2			
Material Group	IIIb (Indoor use only)			
Flammability rating	94V-2			
IP Rating	IP10			
RoHS Compliance	2002/95/EC			

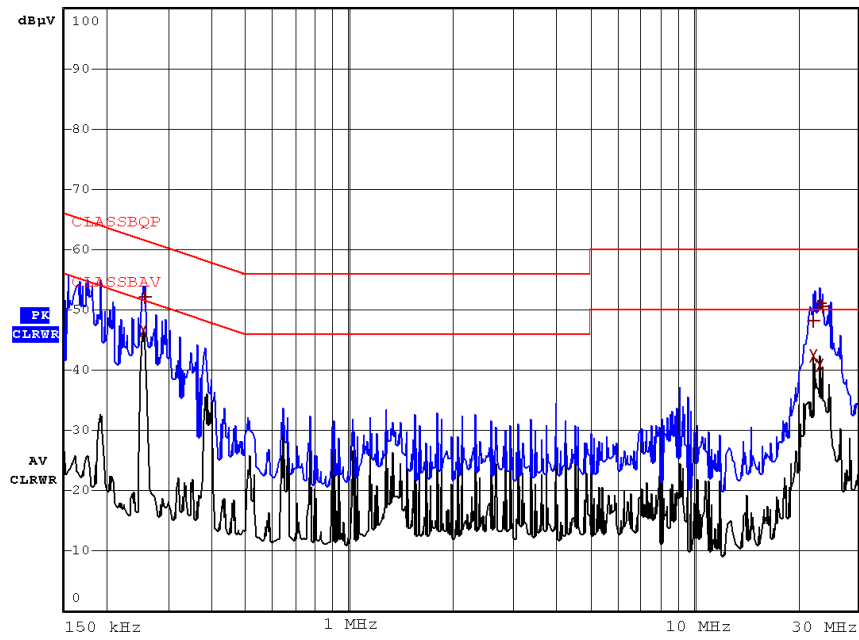
## Electromagnetic compatibility EMC

Parameter	Standard	Level
<b>Emissions</b>		
Radiated electric field	EN55011, EN55022, FCC (with appropriate ferrite cable clamp-on)	B
Conducted emissions	EN55011, EN55022, FCC	B
Harmonic distortion	EN61000-3-2	Compliant
Flicker and fluctuation	EN61000-3-3	Compliant
<b>Immunity</b>		
Electrostatic discharge	EN61000-4-2 (15 kV air, 8 kV contact)	4
Radiated RFI	EN61000-4-3 (10 V/m)	3
Fast transient burst	EN61000-4-4 (4 kV)	4
Input line surges	EN61000-4-5 (1 kV L-N, 2 kV L-E)	3
Conducted RFI	EN61000-4-6 (10 V)	4
Power freq. Magnetic field	EN61000-4-8 (10 A/m)	3
Voltage dips	EN61000-4-11 (EN55024)	Compliant

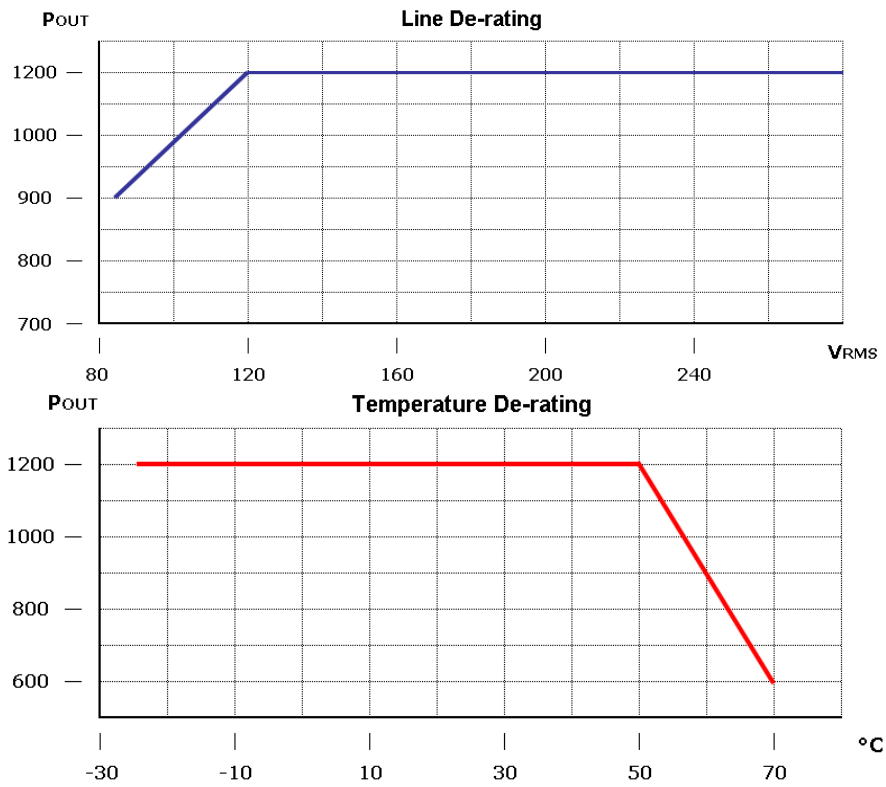
## Reliability

Component	Details	Max	Units
Fan	2X Mag. Lev. Standard	2x2.7	FPMH
Input	Excluding fans	4	FPMH
Output	See output modules specifications	1	FPMH
Warranty		2	Years

Typical Conducted Emissions

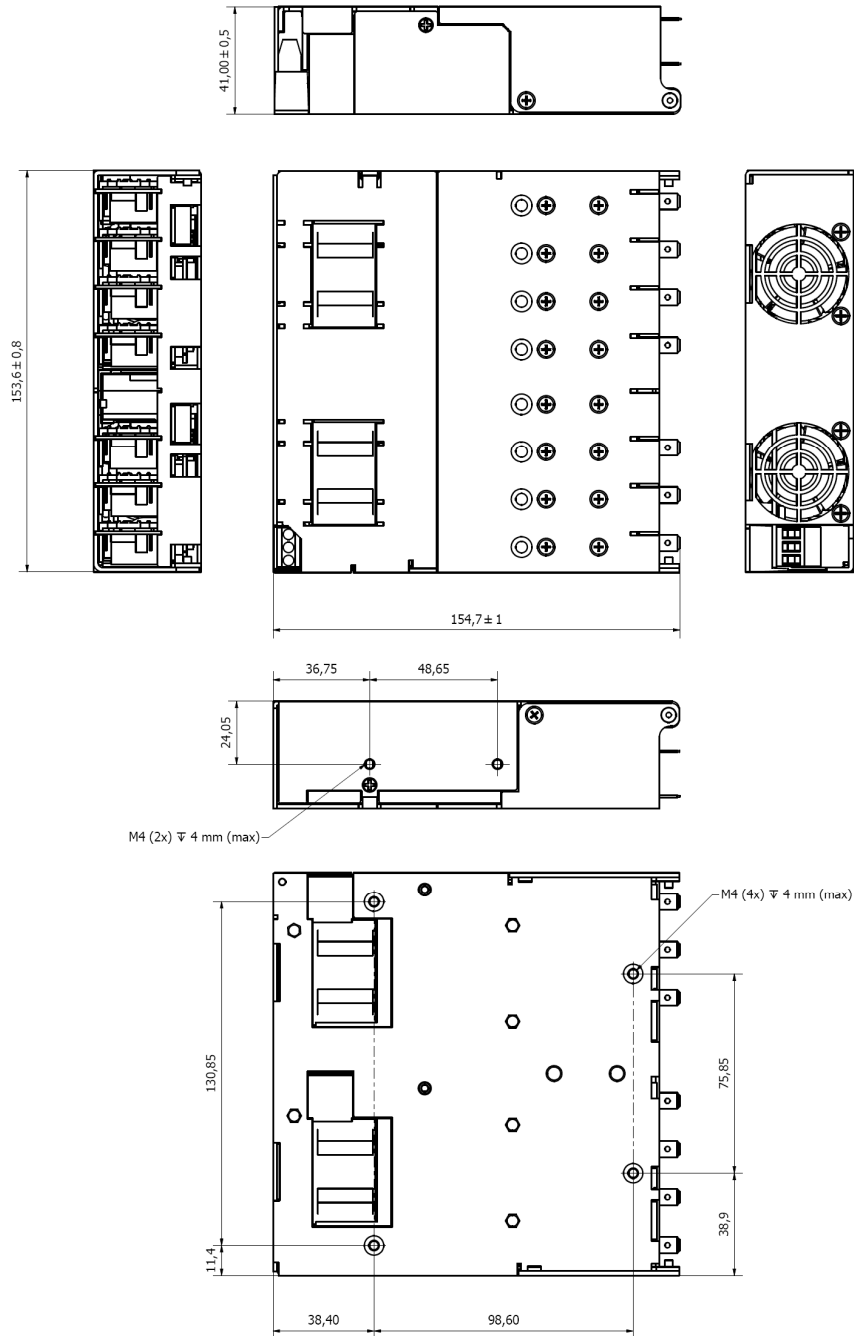


Temperature and Line De-rating



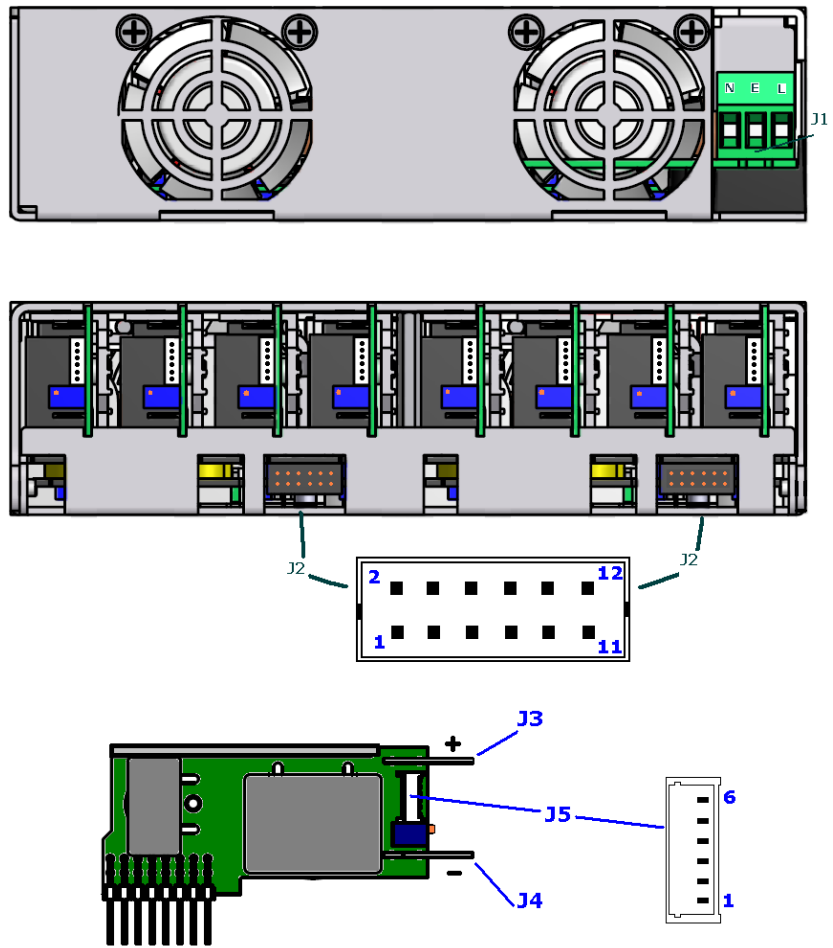
Mechanical Specifications – Outline Drawing and Dimensions

Specification	Details	Nominal	Units
Dimensions	Height is 3.4 mm less than 1U	153.6 x 154.7 x 41.0 6.05 x 6.09 x 1.61	mm in
Weight	Chassis + input	820	g
	Output modules	60	g
	Chassis + input	1.81	lb
	Output modules	0.13	lb
Mounting	Bottom mounting through M4 screws	M4	



## Mechanical Specifications – Connectors and Pin Assignment

PIN ASSIGNMENT	
Circuit	Details
<b>J1</b>	
1	Neutral
2	Earth
3	Live
<b>J2</b>	
1	Power Good Slot #1
2	Inhibit Slot #1
3	Power Good Slot #2
4	Inhibit Slot #2
5	Power Good Slot #3
6	Inhibit Slot #3
7	Power Good Slot #4
8	Inhibit Slot #4
9	Global Inhibit
10	AC OK
11	+5V 200mA, Bias Supply
12	COM
<b>J5</b>	
1	-Sense
2	+Sense
3	Voltage Control
4	Current Control Current Sharing Current Monitor
5	COM
6	+5V 10mA, Bias Supply
<b>J3</b>	
Positive Output	
<b>J4</b>	
Negative Output	



COUNTERPART CONNECTORS				
Reference	Details	Manufacturer	Housing PN	Terminal PN
AC Mains Input <b>J1</b>	AC input connection through flying wire/cord, 14-18 AWG, tin finish, 105 °C, 16 A, 300 V rated.			
Power Unit Signal <b>J2</b>	<ul style="list-style-type: none"> <li>2.00 mm (0.079 in) 12 circuits housing with locking ramp, or, any direct equivalent.</li> <li>Crimp terminal 24-30 AWG, gold finish, or, any direct equivalent.</li> </ul>	Molex	0511101260	0503948051
Output Power <b>J3/J4</b>	<ul style="list-style-type: none"> <li>Quick Disconnect Receptacle compatible with PCB mounting TAB, size 0.80X6.35 mm. Tin finish.</li> </ul>	Vogt AG Tyco Electronics	NA	3967 640907-1
Output Signal <b>J5</b>	<ul style="list-style-type: none"> <li>1.25 mm (0.049 in), 6 circuits housing,</li> <li>Crimp terminal 28-32 AWG, tin finish, or, any direct equivalent</li> </ul>	Molex	0510210600	050058800

**Notes:**

- Output power terminal and wire current rating must exceed maximum short circuit output current.  
E.g. OP-A: 25\*1.25 = 31.25 A.
- Direct equivalents may be used for any connectors parts
- All cables must be rated 105°C min, equivalent to UL1015.
- J1 Ac input line connector: Euroclamp PN. MVE253-5-V.

## Output Specifications – Module A

Parameter	Test conditions / Notes	Min	Nominal	Max	Units
<b>Output voltage range</b>		1.5	5	7.5	V
<b>Rated current</b>				25	A
<b>Average output power</b>				125	W
<b>Peak output power</b>	<5 s, 50% duty cycle			187.5	W
<b>Initial voltage accuracy</b>	Factory set units, Measured at sense terminals	-0.5		0.5	% V <sub>SET</sub>
<b>Output voltage adjustment</b>	Manual: 11-turns potentiometer		0.545		V/turn
<b>Load regulation</b>	Measured at sense terminals	-50		50	mV
<b>Line regulation</b>	Measured at sense terminals	-0.1		0.1	%V <sub>NOM</sub>
<b>Cross regulation</b>	Measured at sense terminals	-0.2		0.2	%V <sub>NOM</sub>
<b>Minimum load</b>			0		A
<b>Output temperature drift</b>		-0.02		0.02	%/°C
<b>Ripple and Noise</b>	20 MHz bandwidth, peak-peak			1	%V <sub>NOM</sub>
<b>Transient response</b>	25% to 75% load transient, at 1A/μs, recovery to within 10% of V <sub>SET</sub>			100	μs
<b>Turn on rise time</b>	Monotonic, 10% to 90%	1.5		3.5	ms
<b>Turn on overshoot</b>				0.1	%V <sub>SET</sub>
<b>Turn on delay</b>	From AC on to Power Good From Enable to Power Good		600 15	750 20	ms ms
<b>Current sharing accuracy</b>				5	%I <sub>MAX</sub>
<b>Open sense offset</b>	Open sense, voltage offset due to bias currents			2	%V <sub>NOM</sub>
<b>Hold-up voltage</b>				6	V
<b>Isolation to ground</b>	Each terminal			250	V
<b>Over current protection</b>	% of rated current	105		125	%I <sub>RATED</sub>
<b>Reverse current protection</b>	% of rated current	-6		0	%I <sub>RATED</sub>
<b>Short circuit protection (Hiccup mode)</b>	Period Duty cycle Voltage threshold (at sense)		125 3 1		ms % V
<b>Over voltage protection</b>	Latching		9.5		V
<b>Over temperature protection</b>	Internally monitored, latching	115		125	°C
<b>Sense cable protection</b>	On positive terminal On negative terminal	-1 none		2 1	V V
<b>Power good threshold</b>	Low threshold only		90		%V <sub>SET</sub>
<b>Output current signal</b>	I <sub>SGN</sub> = 0.6 + I <sub>OUT</sub> /(I <sub>RTD</sub> *1.25)	0		110	%I <sub>RATED</sub>
<b>Current limit control</b>	I <sub>LMT</sub> = (V <sub>CTRL</sub> - 0.6) * I <sub>RTD</sub> *1.25	0		110	%I <sub>RATED</sub>
<b>Remote voltage control</b>	V <sub>OUT</sub> = V <sub>SET</sub> ((1.8- V <sub>CTRL</sub> ) / 0.6)	0		300	%V <sub>SET</sub>
<b>Bias supply</b>	10 mA max	4.5	5	5.2	V
<b>Reliability</b>	At 40 °C, 80% load			1	FPMH
<b>Warranty</b>				2	Years
<b>Wire size</b>	Power cables	12	10		AWG
<b>Weight</b>				60	g
<b>Size</b>	60 mm x 35 mm x 17 mm, or, 2.36 in x 1.38 in x 0.67 in				

## Output Specifications – Module B

Parameter	Test conditions / Notes	Min	Nominal	Max	Units
<b>Output voltage range</b>		4.5	12	15	V
<b>Rated current</b>				15	A
<b>Average output power</b>				150	W
<b>Peak output power</b>	<5 s, 50% duty cycle			225	W
<b>Initial voltage accuracy</b>	Factory set units, Measured at sense terminals	-0.5		0.5	% V <sub>SET</sub>
<b>Output voltage adjustment</b>	Manual: 11-turns potentiometer		0.954		V/turn
<b>Load regulation</b>	Measured at sense terminals	-100		100	mV
<b>Line regulation</b>	Measured at sense terminals	-0.1		0.1	%V <sub>NOM</sub>
<b>Cross regulation</b>	Measured at sense terminals	-0.2		0.2	%V <sub>NOM</sub>
<b>Minimum load</b>			0		A
<b>Output temperature drift</b>		-0.02		0.02	%/°C
<b>Ripple and Noise</b>	20 MHz bandwidth, peak-peak			1	%V <sub>NOM</sub>
<b>Transient response</b>	25% to 75% load transient, at 0.5A/μs; recovery to within 10% of V <sub>SET</sub>			1.5	V
<b>Turn on rise time</b>	Monotonic, 10% to 90%	1.5		3.5	ms
<b>Turn on overshoot</b>				0.1	%V <sub>SET</sub>
<b>Turn on delay</b>	From AC on to Power Good From Enable to Power Good		600 15	750 20	ms ms
<b>Current sharing accuracy</b>				5	%I <sub>MAX</sub>
<b>Open sense offset</b>	Open sense, voltage offset due to bias currents			2	%V <sub>NOM</sub>
<b>Hold-up voltage</b>				12.5	V
<b>Isolation to ground</b>	Each terminal			250	V
<b>Over current protection</b>	% of rated current	105		125	%I <sub>RATED</sub>
<b>Reverse current protection</b>	% of rated current	-6		0	%I <sub>RATED</sub>
<b>Short circuit protection (Hiccup mode)</b>	Period Duty cycle Voltage threshold (at sense)		125 3 2		ms % V
<b>Over voltage protection</b>	Latching		18		V
<b>Over temperature protection</b>	Internally monitored, latching	115		125	°C
<b>Sense cable protection</b>	On positive terminal On negative terminal	-1 none		2 1	V
<b>Power good threshold</b>	Low threshold only		90		%V <sub>NOM</sub>
<b>Output current signal</b>	$I_{SGN} = 0.6 + I_{OUT}/(I_{RTD}*1.25)$	0		110	%I <sub>RATED</sub>
<b>Current limit control</b>	$I_{LMT} = (V_{CTRL} - 0.6) * I_{RTD}*1.25$	0		110	%I <sub>RATED</sub>
<b>Remote voltage control</b>	$V_{OUT} = V_{SET} ((1.8 - V_{CTRL}) / 0.6)$	0		300	%V <sub>SET</sub>
<b>Bias supply</b>	10 mA maximum	4.5	5	5.2	V
<b>Reliability</b>	At 40 °C, 80% load			1	FPMH
<b>Warranty</b>				2	Years
<b>Wire size</b>	Power cables	16	14	10	AWG
<b>Weight</b>				60	g
<b>Size</b>	60 mm x 35 mm x 17 mm, or, 2.36 in x 1.38 in x 0.67 in				

## Output Specifications – Module C

Parameter	Test conditions / Notes	Min	Nominal	Max	Units
<b>Output voltage range</b>		9	24	30	V
<b>Rated current</b>				7.5	A
<b>Average output power</b>				150	W
<b>Peak output power</b>	<5 s, 50% duty cycle			225	W
<b>Initial voltage accuracy</b>	Factory set units, Measured at sense terminals	-0.5		0.5	% V <sub>SET</sub>
<b>Output voltage adjustment</b>	Manual: 11-turns potentiometer		1.9		V/turn
<b>Load regulation</b>	Measured at sense terminals	-150		150	mV
<b>Line regulation</b>	Measured at sense terminals	-0.1		0.1	%V <sub>NOM</sub>
<b>Cross regulation</b>	Measured at sense terminals	-0.2		0.2	%V <sub>NOM</sub>
<b>Minimum load</b>			0		A
<b>Output temperature drift</b>		-0.02		0.02	%/°C
<b>Ripple and Noise</b>	20 MHz bandwidth, peak-peak			1	%V <sub>NOM</sub>
<b>Transient response</b>	25% to 75% load transient, at 0.25A/μs; recovery to within 10% of V <sub>SET</sub>			3	V
				100	μs
<b>Turn on rise time</b>	Monotonic, 10% to 90%	1.5		3.5	ms
<b>Turn on overshoot</b>				0.1	%V <sub>SET</sub>
<b>Turn on delay</b>	From AC on to Power Good		600	750	ms
	From Enable to Power Good		15	20	ms
<b>Current sharing accuracy</b>				5	%I <sub>MAX</sub>
<b>Open sense offset</b>	Open sense, voltage offset due to bias currents			2	%V <sub>NOM</sub>
<b>Hold-up voltage</b>				25	V
<b>Isolation to ground</b>	Each terminal			250	V
<b>Over current protection</b>	% of rated current	105		125	%I <sub>RATED</sub>
<b>Reverse current protection</b>	% of rated current	-6		0	%I <sub>RATED</sub>
<b>Short circuit protection (Hiccup mode)</b>	Period		125		ms
	Duty cycle		3		%
	Voltage threshold (at sense)		3.5		V
<b>Over voltage protection</b>	Latching		36		V
<b>Over temperature protection</b>	Internally monitored, latching	115		125	°C
<b>Sense cable protection</b>	On positive terminal	-1		2	V
	On negative terminal	none		1	
<b>Power good threshold</b>	Low threshold only		90		%V <sub>SET</sub>
<b>Output current signal</b>	$I_{SGN} = 0.6 + I_{OUT}/(I_{RTD} * 1.25)$	0		110	%I <sub>RATED</sub>
<b>Current limit control</b>	$I_{LMT} = (V_{CTRL} - 0.6) * I_{RTD} * 1.25$	0		110	%I <sub>RATED</sub>
<b>Remote voltage control</b>	$V_{OUT} = V_{SET} * ((1.8 - V_{CTRL}) / 0.6)$	0		300	%V <sub>SET</sub>
<b>Bias supply</b>	10 mA max	4.5	5	5.2	V
<b>Reliability</b>	At 40 °C, 80% load			1	FPMH
<b>Warranty</b>				2	Years
<b>Wire size</b>	Power cables	20	18	10	AWG
<b>Weight</b>				60	g
<b>Size</b>	60 mm x 35 mm x 17 mm, or, 2.36 in x 1.38 in x 0.67 in				

## Output Specifications – Module D

Parameter	Test conditions / Notes	Min	Nominal	Max	Units
<b>Output voltage range</b>		18	48	58	
<b>Rated current</b>				3.75	A
<b>Average output power</b>				150	W
<b>Peak output power</b>	Less than 5 s, 50% duty cycle			225	W
<b>Initial voltage accuracy</b>	Factory set units, Measured at sense terminals	-0.5		0.5	% V <sub>SET</sub>
<b>Output voltage adjustment</b>	Manual: 11-turns potentiometer		3.6		V/turn
<b>Load regulation</b>	Measured at sense terminals	-300		300	mV
<b>Line regulation</b>	Measured at sense terminals	-0.1		0.1	%V <sub>NOM</sub>
<b>Cross regulation</b>	Measured at sense terminals	-0.2		0.2	%V <sub>NOM</sub>
<b>Minimum load</b>			0		A
<b>Output temperature drift</b>		-0.02		0.02	%/°C
<b>Ripple and Noise</b>	20 MHz bandwidth, peak-peak			1	%V <sub>NOM</sub>
<b>Transient response</b>	25% to 75% load transient, at 0.25A/μs; recovery to within 10% of V <sub>SET</sub>			3	V
<b>Turn on rise time</b>	Monotonic, 10% to 90%	1.5		3.5	ms
<b>Turn on overshoot</b>				0.1	%V <sub>SET</sub>
<b>Turn on delay</b>	From AC on to Power Good From Enable to Power Good		600 15	750 20	ms ms
<b>Current sharing accuracy</b>				5	%I <sub>MAX</sub>
<b>Open sense offset</b>	Open sense, voltage offset due to bias currents			2	%V <sub>NOM</sub>
<b>Hold-up voltage</b>				50	V
<b>Isolation to ground</b>	Each terminal			250	V
<b>Over current protection</b>	% of rated current	105		125	%I <sub>RATED</sub>
<b>Reverse current protection</b>	% of rated current	-6		0	%I <sub>RATED</sub>
<b>Short circuit protection (Hiccup mode)</b>	Period Duty cycle Voltage threshold (at sense)		125 3 3.5		ms % V
<b>Over voltage protection</b>	Latching		66		V
<b>Over temperature protection</b>	Internally monitored, latching	115		125	°C
<b>Sense cable protection</b>	On positive terminal On negative terminal	-3 none		3 2	V
<b>Power good threshold</b>	Low threshold only		90		%V <sub>SET</sub>
<b>Output current signal</b>	$I_{SGN} = 0.6 + I_{OUT}/(I_{RTD}*1.25)$	0		110	%I <sub>RATED</sub>
<b>Current limit control</b>	$I_{LMT} = (V_{CTRL} - 0.6) * I_{RTD}*1.25$	0		110	%I <sub>RATED</sub>
<b>Remote voltage control</b>	$V_{OUT} = V_{SET} ((1.8 - V_{CTRL}) / 0.6)$	0		300	%V <sub>SET</sub>
<b>Bias supply</b>	10 mA max	4.5	5	5.2	V
<b>Reliability</b>	At 40 °C, 80% load			1	FPMH
<b>Warranty</b>				2	Years
<b>Wire size</b>	Power cables	20	18	10	AWG
<b>Weight</b>				60	g
<b>Size</b>	60 mm x 35 mm x 17 mm, or, 2.36 in x 1.38 in x 0.67 in				

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