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.

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

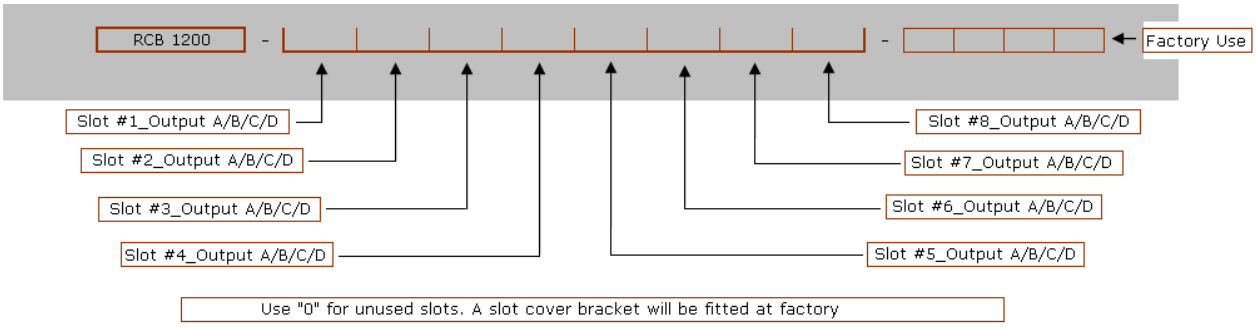
KEY FEATURES

- Universal input voltage
- Active power factor correction
- High power density (>20 W/in^3)
- 1200W output in 6.09"x 6.05" footprint, 1U height
- Field configurable
- High reliability
- High efficiency (up to 89%)
- No line de-rating above 120 V_{AC}
- 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
A	5 V	25.0 A	1.5 to 7.5 V	±50 mV	±0.1 %V_{NOM}	9.5 V	125 W
B	12 V	15.0 A	4.5 to 15 V	±100 mV	±0.1 %V_{NOM}	18 V	150 W
C	24 V	7.5 A	9 to 30 V	±150 mV	±0.1 %V_{NOM}	36 V	150 W
D	48 V	3.75 A	18 to 58 V	±300 mV	±0.1 %V_{NOM}	66 V	150 W
0 (zero)	Unused slots						

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Input Specifications

Parameter	Details	Min	Typ	Max	Units
AC input voltage	Nominal range is 100 to 240 V_{RMS}	85		264	V_{RMS}
AC input frequency		47	50/60	63	Hz
DC input voltage		120		370	V_{DC}
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_{RMS} input			12	A
Inrush current	264 V_{RMS}, 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 All outputs fitted and disabled		56 42		W
Power factor	Typical value at 1200 W output at 240 V_{RMS}		0.96	0.99	
Hold up	1200 W output at 120 V_{RMS} input	17	20	21	ms
UVLO	Turn on only	78		84	V_{RMS}
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_{AC}
	Input to Chassis		1500	V_{AC}
	Output to Chassis		250	V_{DC}
	Output to Output		250	V_{DC}
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_{AC}, 63 Hz, 25°C		1500	µA
Agency Approvals	$_{C}UR_{US}$, Demko, CB Certificate			
Standards	IEC/EN60950-1; UL60950-1/CSAC22.2No.60950-1-03; CE Mark: LVD 73/23/EEC.			
Agency File Numbers	UL : to be released D : to be released CB : to be released			

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Environmental

Parameter	Details	Min	Max	Units
Storage				
Temperature		-40	+85	°C
Humidity	Relative, non condensing	5	95	%
Altitude		-200	5000	m
Air pressure		54	106	kPa
Operating				
Temperature	Full power Input and Output Modules de-rate by 2.5%/°C above 50°C.	-20 50	50 70	°C °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			
Installation				
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			

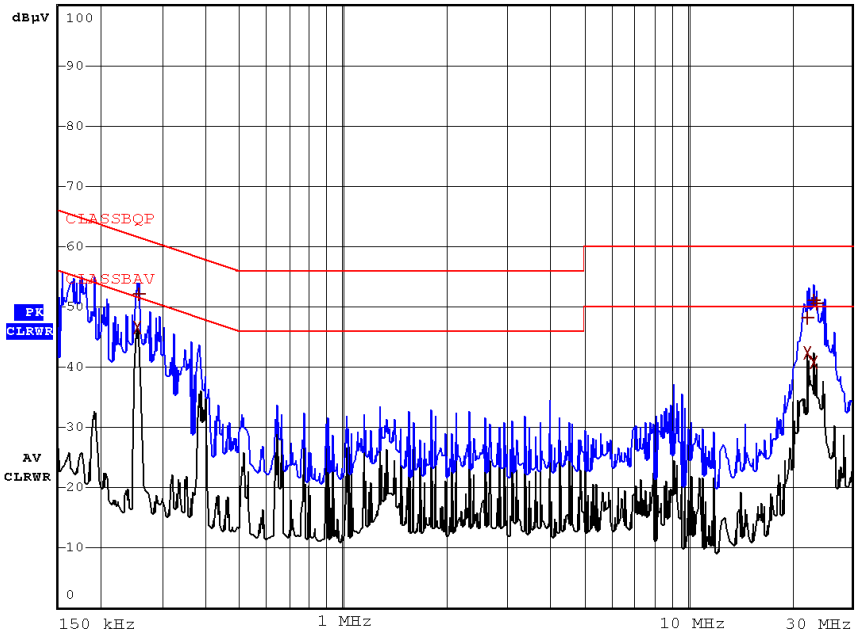
Electromagnetic compatibility EMC

Parameter	Standard	Level
Emissions		
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
Immunity		
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

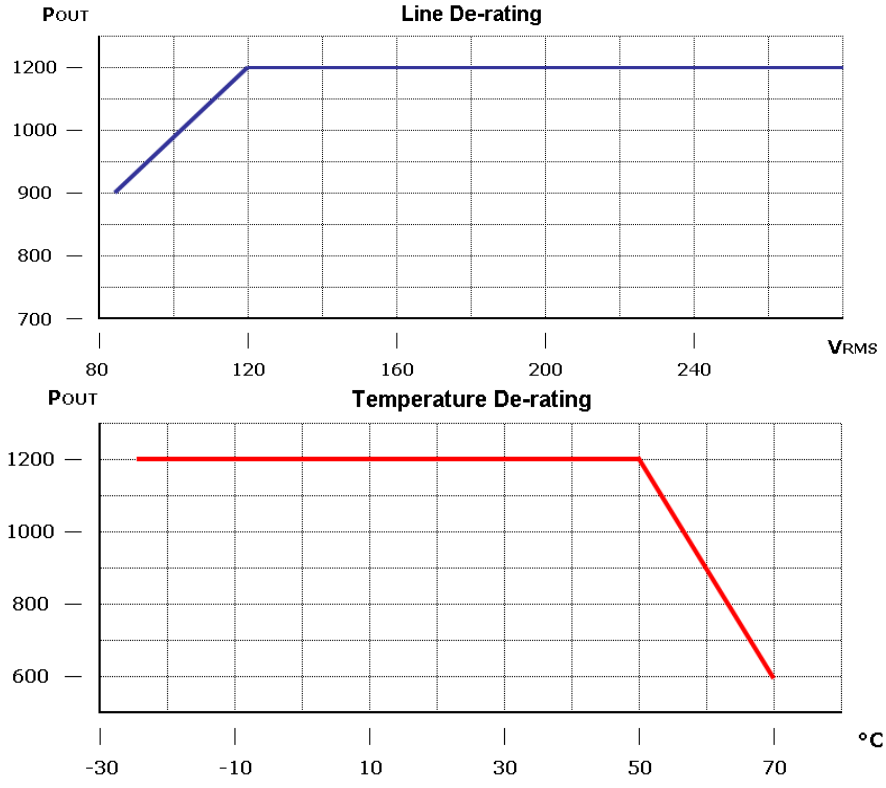
Reliability

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



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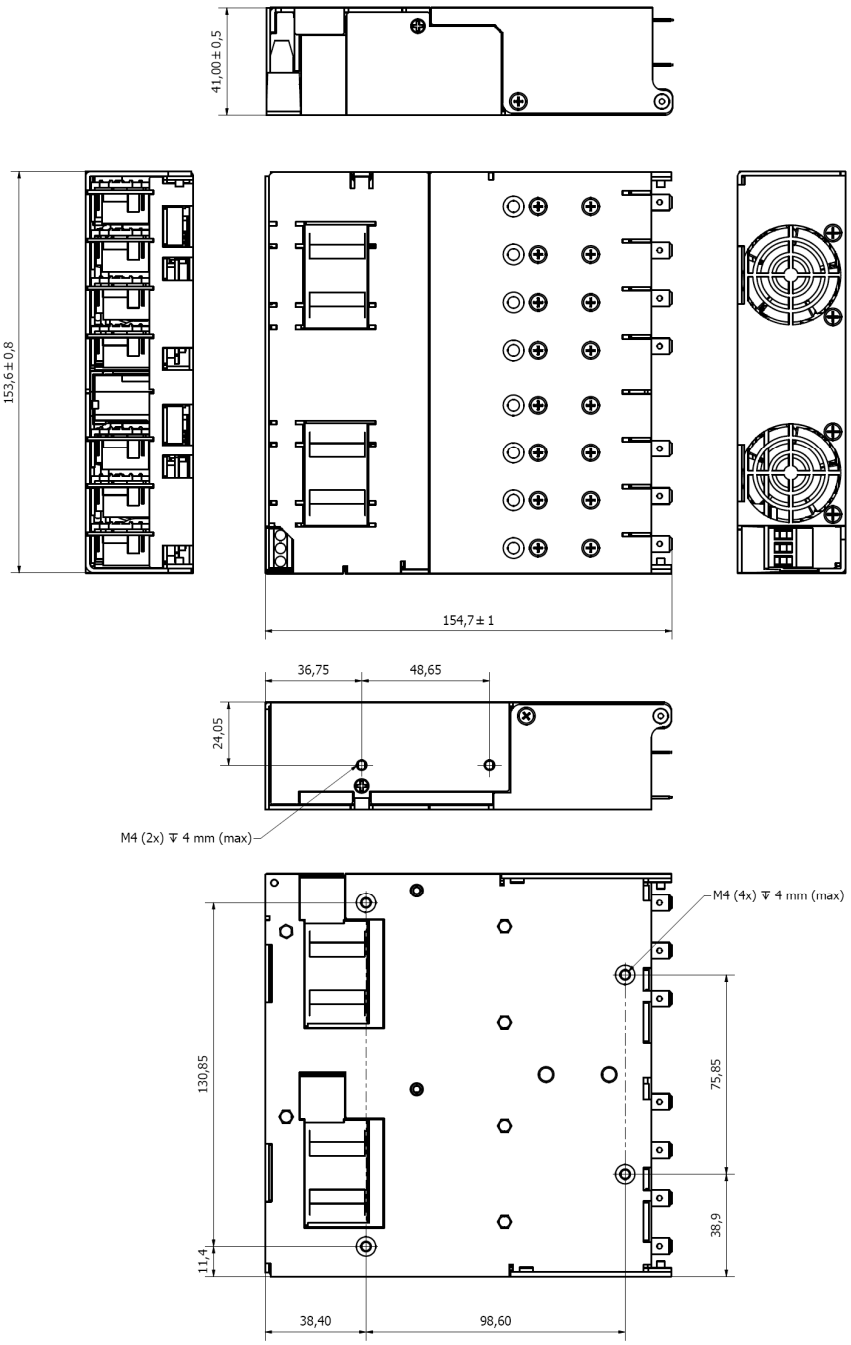
Mechanical Specifications – Outline Drawing and Dimensions

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	



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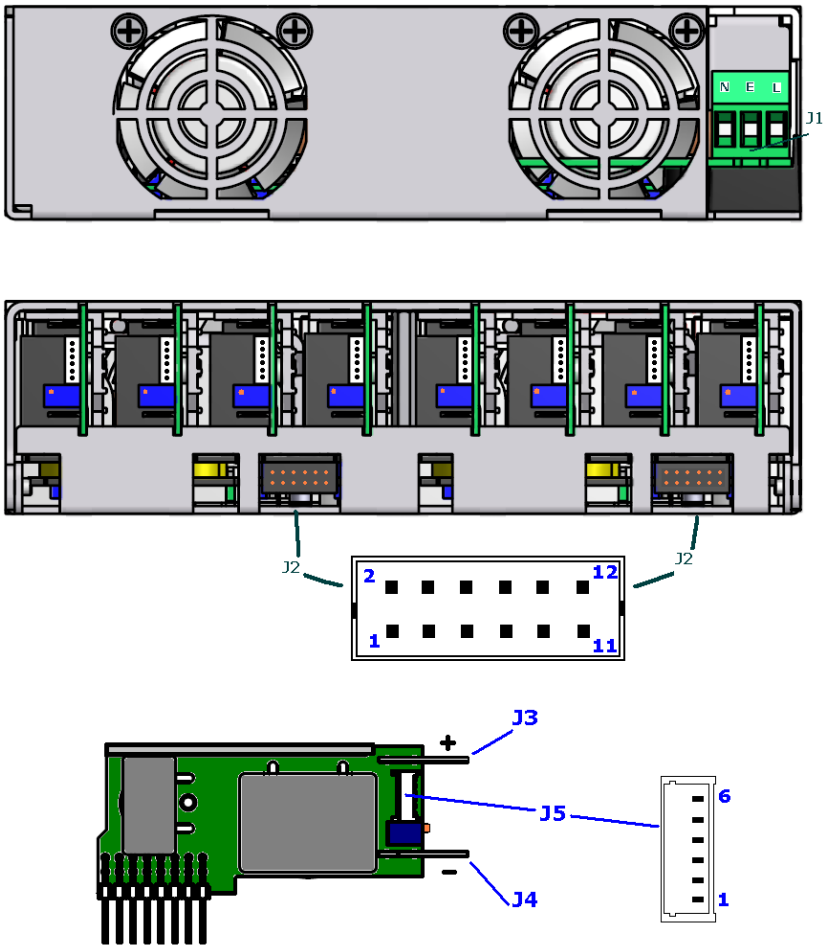
Mechanical Specifications – Connectors and Pin Assignment

PIN ASSIGNMENT	
Circuit	**Details**
J1	
1	Neutral
2	Earth
3	Live
J2	
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
J5	
1	–Sense
2	+Sense
3	Voltage Control
4	Current Control Current Sharing Current Monitor
5	COM
6	+5V 10mA, Bias Supply
J3	
Positive Output	
J4	
Negative Output	



COUNTERPART CONNECTORS				
Reference	**Details**	**Manufacturer**	**Housing PN**	**Terminal PN**
AC Mains Input **J1**	AC input connection through flying wire/cord, 14-18 AWG, tin finish, 105 °C, 16 A, 300 V rated.			
Power Unit Signal **J2**	• 2.00 mm (0.079 in) 12 circuits housing with locking ramp, or, any direct equivalent. • Crimp terminal 24-30 AWG, gold finish, or, any direct equivalent.	Molex	0511101260	0503948051
Output Power **J3/J4**	• Quick Disconnect Receptacle compatible with PCB mounting TAB, size 0.80X6.35 mm. Tin finish.	Vogt AG Tyco Electronics	NA	3967 640907-1
Output Signal **J5**	• 1.25 mm (0.049 in), 6 circuits housing, • Crimp terminal 28-32 AWG, tin finish, or , any direct equivalent	Molex	0510210600	050058800

Notes:

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

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Output Specifications – Module A

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

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Output Specifications – Module B

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

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Output Specifications – Module C

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

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Output Specifications – Module D

Parameter	Test conditions / Notes	Min	Nominal	Max	Units
Output voltage range		18	48	58	
Rated current				3.75	A
Average output power				150	W
Peak output power	Less than 5 s, 50% duty cycle			225	W
Initial voltage accuracy	Factory set units, Measured at sense terminals	-0.5		0.5	% V_{SET}
Output voltage adjustment	Manual: 11-turns potentiometer		3.6		V/turn
Load regulation	Measured at sense terminals	-300		300	mV
Line regulation	Measured at sense terminals	-0.1		0.1	$\%V_{NOM}$
Cross regulation	Measured at sense terminals	-0.2		0.2	$\%V_{NOM}$
Minimum load			0		A
Output temperature drift		-0.02		0.02	%/°C
Ripple and Noise	20 MHz bandwidth, peak-peak			1	$\%V_{NOM}$
Transient response	25% to 75% load transient, at 0.25A/µs; recovery to within 10% of V_{SET}			3 100	V µs
Turn on rise time	Monotonic, 10% to 90%	1.5		3.5	ms
Turn on overshoot				0.1	$\%V_{SET}$
Turn on delay	From AC on to Power Good From Enable to Power Good		600 15	750 20	ms ms
Current sharing accuracy				5	$\%I_{MAX}$
Open sense offset	Open sense, voltage offset due to bias currents			2	$\%V_{NOM}$
Hold-up voltage				50	V
Isolation to ground	Each terminal			250	V
Over current protection	% of rated current	105		125	$\%I_{RATED}$
Reverse current protection	% of rated current	-6		0	$\%I_{RATED}$
Short circuit protection (Hiccup mode)	Period Duty cycle Voltage threshold (at sense)		125 3 3.5		ms % V
Over voltage protection	Latching		66		V
Over temperature protection	Internally monitored, latching	115		125	°C
Sense cable protection	On positive terminal On negative terminal	-3 none		3 2	V
Power good threshold	Low threshold only		90		$\%V_{SET}$
Output current signal	$I_{SGN} = 0.6 + I_{OUT}/(I_{RTD}*1.25)$	0		110	$\%I_{RATED}$
Current limit control	$I_{LMT} = (V_{CTRL} - 0.6) * I_{RTD}*1.25$	0		110	$\%I_{RATED}$
Remote voltage control	$V_{OUT} = V_{SET} ((1.8- V_{CTRL}) / 0.6)$	0		300	$\%V_{SET}$
Bias supply	10 mA max	4.5	5	5.2	V
Reliability	At 40 °C, 80% load			1	FPMH
Warranty				2	Years
Wire size	Power cables	20	18	10	AWG
Weight				60	g
Size	60 mm x 35 mm x 17 mm, or, 2.36 in x 1.38 in x 0.67 in				

Eu and RoW

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