

### 650 Watts

- Medical (BF) Safety Approvals
- 4" x 8" Package
- 5V Standby Supply
- AC OK, Inhibit & Remote Sense
- Class B Conducted & Radiated Emissions
- 3 Year Warranty



The PBR650 series of AC-DC switching power supplies, in a package of just 4 x 8 x 2.58 inches, deliver 600-650 watts of continuous power. They are designed for medical applications including those needing BF rated insulation with an operation altitude of up to 5000m.

#### Dimensions:

**PBR650:**  
8.00 x 4.00 x 2.58" (203.2 x 101.6 x 65.5 mm)

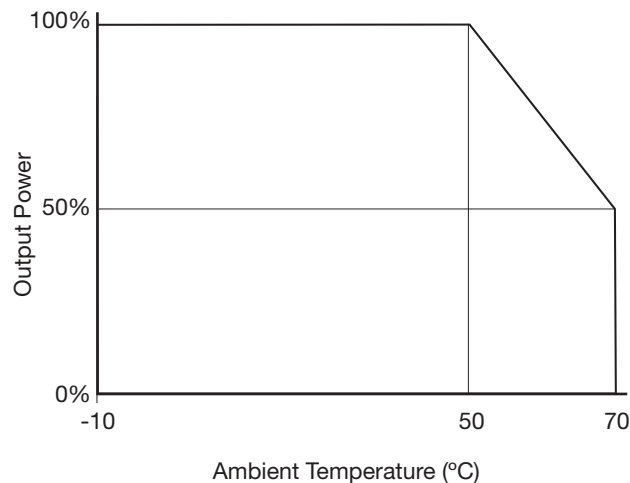
### Models & Ratings

Output Voltage V1	Output Current V1 <sup>(2)</sup>		Standby Supply V2	Ripple & Noise <sup>(1)</sup>	Model Number <sup>(4)</sup>
	Nominal	Peak <sup>(3)</sup>			
12 V	50.00 A	55.00 A	5.0 V / 0.2 A	120 mV	PBR650PS12C
15 V	40.00 A	44.00 A		150 mV	PBR650PS15C
18 V	36.12 A	40.00 A		180 mV	PBR650PS18C
24 V	27.09 A	30.00 A		240 mV	PBR650PS24C
28 V	23.22 A	25.50 A		280 mV	PBR650PS28C
36 V	18.06 A	20.00 A		360 mV	PBR650PS36C
48 V	13.55 A	15.00 A		480 mV	PBR650PS48C
57 V	11.41 A	12.50 A		570 mV	PBR650PS57C

#### Notes

1. Ripple and noise is the maximum peak-to-peak voltage value measured at the output with 20 MHz bandwidth, at rated line voltage and output load, and with a 10  $\mu$ F tantalum capacitor in parallel with a 0.1  $\mu$ F ceramic capacitor.
2. All models may be operated at no-load without damage. At no load, output voltage fluctuates beyond 5% due to burst-mode operation of the control IC for energy saving.
3. Peak current available for 15s max, 10% duty cycle, average power not to exceed nominal power rating.
4. For single fuse option add suffix -SP, e.g. PBR650PS12C-SP

#### Temperature Derating Curve



### Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage	80		264	VAC	Derate to 90% at 85 VAC & 80% at 80 VAC
Input Frequency	47		63	Hz	
Input Current - Full Load		8.4/4.2		A (rms)	115/230 VAC, 60/50 Hz
Earth Leakage Current		225	275	µA	264 VAC, 63 Hz

### Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage	12		57	VDC	See Models and Ratings table
Tolerance			±2	%	Line and Load Regulation, 0.1% minimum load required to meet specification
Transient Response			4	%	Recovery within 1% in less than 500 µs for a 25% step load change
Ripple & Noise			1	% pk-pk	20 MHz bandwidth, see model table notes
Overvoltage Protection	115		140	%	Latching
Overcurrent Protection	115		140	%	Trip & restart characteristic
Thermal Shutdown					Protected for overtemperature conditions, latching
Temperature Coefficient			±0.04	%/°C	
5 V Standby Supply			5	V	At 200 mA
Patient Leakage Current		50	80	µA	264 VAC, 63 Hz

### Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-10		+70	°C	Derate Linearly from 100% load at +50 °C to 50% load at +70 °C
Storage Temperature	-40		+85	°C	
Humidity	5		95	%RH	Non-condensing
Cooling					Integral temperature controlled fan. Fan speed based on temperature of transformer T1, internally monitored. Fan will not rotate until T1 temperature reaches approx. 60 °C and reaches full speed when T1 temperature reaches approx. 80 °C.

### General

Characteristic		Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency			90		%	230 VAC, 100% load
Isolation	Input to Output	4000			VAC	2 x MOPP
	Input to Ground	1500			VAC	1 X MOPP
	Output to Ground	1500			VAC	1 X MOPP
Switching Frequency	PFC	55	65	75	kHz	Fixed
	Main Converter	90		300		Variable
	Standby Converter	124	132	140		Variable
Hold Up Time		12	20		ms	At 110 VAC & 650 W
Inrush Current			30/60		VAC	115 VAC/230 VAC at 25 °C, cold start
Mean Time Between Failure			190,000		Hrs	MIL-HDBK-217F, Full load at 25 °C GB
Weight			4.4 (2000)		lb (g)	

### Signals & Controls

Characteristic	Notes & Conditions
Remote Sense	Compensates for 0.5V total voltage drop.
Inhibit	To inhibit apply TTL high signal .
AC OK	TTL high for normal operation, low upon loss of input power, turn-on delay time 100-1000 ms, turn-off delay time 1 ms minimum

### EMC: Emissions

Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55011/EN55032	Class B	
Radiated	EN55011/EN55032	Class B	
Harmonic Current	EN61000-3-2	Class A	
Voltage Fluctuations	EN61000-3-3		

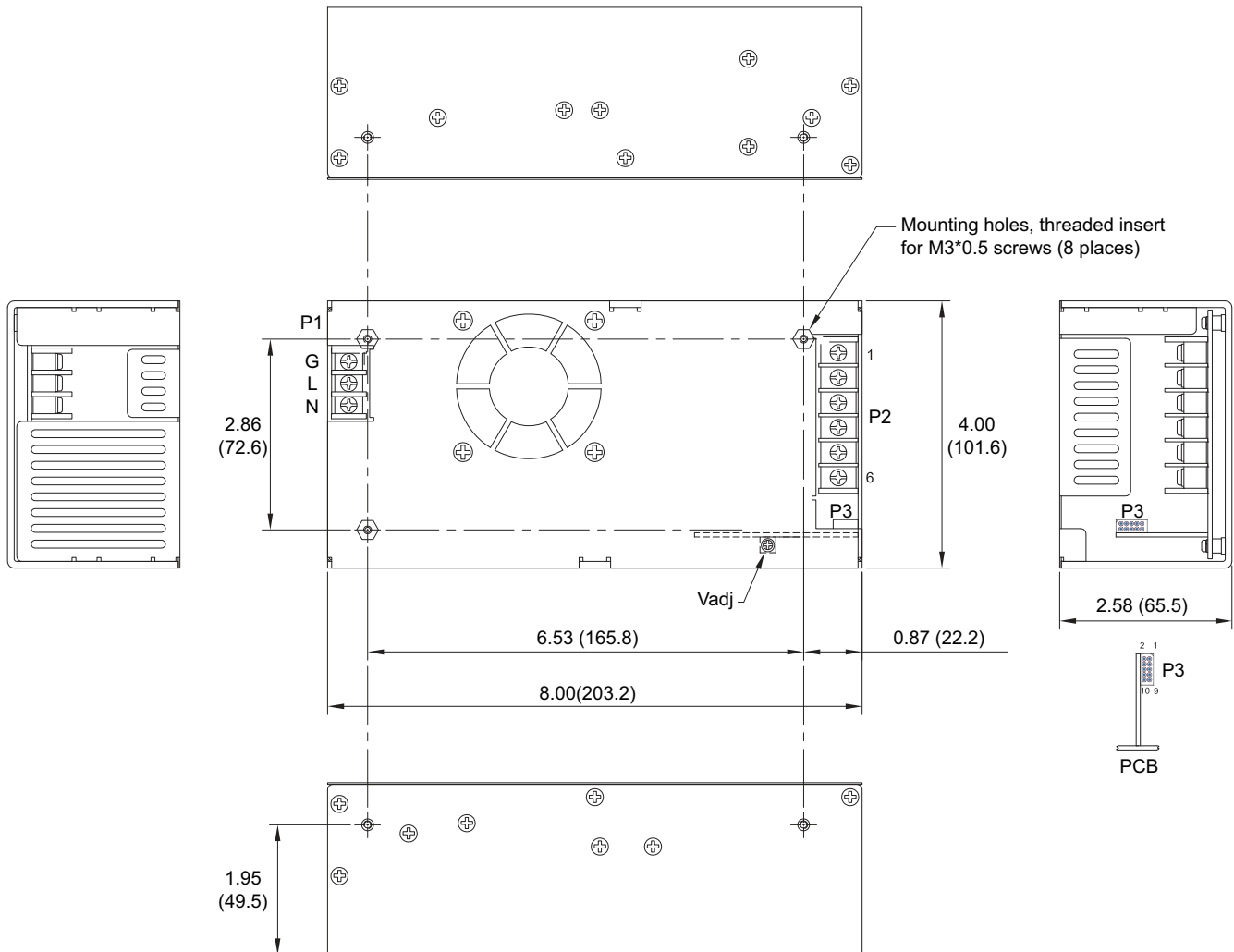
### EMC: Immunity

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD	EN61000-4-2	4	A	±8 kV contact, ±15 kV air
Radiated	EN61000-4-3	10 V/m	A	
EFT	EN61000-4-4	±2 kV	A	
Surges	EN61000-4-5	Installation class 3	A	±1 kV differential/ ±2 kV common mode
Conducted	EN61000-4-6	10 Vrms	A	
Magnetic Field	EN61000-4-8	30 A/m	A	
Dips and Interruptions	100 VAC/60 Hz	Dip 30% (70 VAC), 500ms	A	
		Dip 60% (40 VAC), 100ms	B	
		Int >95% (0 VAC), 10ms	A	
		Int 100% (0 VAC), 20ms	A	
		Int 100% (0 VAC), 5000ms	B	
	230 VAC/50 Hz	Dip 30% (161 VAC), 500ms	A	
		Dip 60% (92 VAC), 100ms	A	
		Int >95% (0 VAC), 10ms	A	
		Int 100% (0 VAC), 20ms	A	
		Int 100% (0 VAC), 5000ms	B	

### Safety Approvals

Safety Agency	Safety Standard	Notes & Conditions
CB Report	IEC60601-1	Medical
UL	ES60601-1, CSA C22.2 No.60601-1	Medical
EN	EN60601-1	Medical
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

### Mechanical Details



Input Connector - P1	
Pin 1	G
Pin 2	L
Pin 3	N

Output Connector - P2	
Pin 1	+V1
Pin 2	+V1
Pin 3	+V1
Pin 4	Com
Pin 5	Com
Pin 6	Com

P3	
Pin 1	+V1 Sense
Pin 2	+V1 Sense
Pin 3	AC OK
Pin 4	Common Return
Pin 5	N/C
Pin 6	N/C
Pin 7	Inhibit
Pin 8	N/C
Pin 9	+5V Standby
Pin 10	+5V Standby Return

### Notes

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Input connector P1 is Dinkle terminal P/N DT-35C-B01W-03, with nickel plated M3 screws.
- Output connector P2 is Dinkle Terminal P/N DT-4N-B01W-06 with nickel plated M3.5 screw.
- Connector P3 is JST Header S10B-PHDSS, or equivalent, mating with JST housing PHDR-10VS or equivalent.
- Weight: 1.4 kg (3.1 lbs.) approx.
- Maximum penetration of fixing screws is 4 mm from the outer surface of chassis.