

APPLICATION NOTE

10 July 2014

JITTERBUG v1.0 POWER SUPPLY

Jitterbug's domain power distribution system requires a 5V input with a current of approximately 1.5A to 3.75A.

IOL engineering has selected a power supply from CUI, part number VGD-30-512. This supply was selected based on the following criteria:

- Clean power output with relatively nominal transformer artifacts injecting noise;
- Enough current to transfer power across a maximum of 6 Jitterbug domains;
- Long term manufacturer product support;
- Universal power input to simplify product marketing;
- Convenient packaging to simplify assembly & mitigate UL listing requirements;
- Convenient packaging for safety purposes & to mitigate liability;
- Quality product which passed our stringent testing on an Audio Precision 2722A;
- Widely distributed and available off the shelf;
- Reasonable price point with factory direct pricing at larger volumes available.

IOL's Assembly Partners may decide to choose another supply. Our engineering team requests that care be taken to guarantee that any spurious ambient noise generated by the power supply is not injected into the digital audio data stream, and that current levels measured on Domain #6 are similar to those on the output of Domain #1.

WIRING PATTERN

Power to be applied to Jitterbug at incoming power connector P1 from specified CUI supply:

- Pins 1 & 4 = Ground
- Pins 2 & 3 = +5V

Pin 1 on Jitterbug's power input is identified by a square solder post (underneath the board).

After supplying power to the first Jitterbug in a chain, the boards will pass/route all power to any downstream domains (maximum 6 Jitterbugs tested).

SERIES: VGD-30 | DESCRIPTION: AC-DC POWER SUPPLY
FEATURES

- up to 30 W continuous power
- universal input (85~264 Vac / 120~370 Vdc)
- dual output
- overload, over voltage, and short circuit protections
- UL/cUL and Intertek EN 60950-1 safety approvals
- built-in EMI filter
- efficiency up to 80%



MODEL	output voltage (Vdc)	output current		output power ¹ max (W)	ripple and noise ² max (mVp-p)	efficiency typ (%)
		min (A)	max (A)			
VGD-30-D512	5	0.3	4	30	80	79
	12	0.3	2		120	
VGD-30-D524	5	0.3	4	30	80	80
	24	0.2	1		240	

Note: 1. Maximum total combined power.
2. Ripple & noise are measured at 20 MHz BW with 22 μ F aluminum electrolytic capacitor and 0.1 μ F ceramic capacitor on the output.

PART NUMBER KEY


INPUT

parameter	conditions/description	min	typ	max	units
voltage		85		264	Vac
		120		370	Vdc
frequency		47		63	Hz
input current	115 Vac			0.6	A
	230 Vac			0.35	A
inrush current	115 Vac, full load, cold start			30	A
	230 Vac, full load, cold start			60	A

OUTPUT

parameter	conditions/description	min	typ	max	units
line regulation			±1		%
load regulation			±5		%
temperature coefficient			±0.03		%/°C
hold-up time	115 Vac, full load		10		ms
	230 Vac, full load		50		ms
adjustability	adjustable with built-in trim pot ¹	-5		+5	%

Note: 1. Adjustment of 5 V output only.

PROTECTIONS

parameter	conditions/description	min	typ	max	units
over voltage protection	shut down and latch off, recover after restart.			7	V
overload protection	hiccup mode, automatically recovers	110		160	%
short circuit protection	continuous, automatically recovers				

SAFETY & COMPLIANCE

parameter	conditions/description	min	typ	max	units
isolation voltage	input to output		3,000		Vac
	input to case		1,500		Vac
	output to case		500		Vac
isolation resistance	input to output at 500 Vdc at 25°C	100			MΩ
safety approvals	UL 60950-1, Intertek EN 60950-1				
EMI/EMC	EN 55022 (CISPR22) Class B, EN 61000-3-2,-3,-4-2,3,4,5,6,8,11; EN 55024				
leakage current	at 240 Vac			3.5	mA
MTBF	MIL-HDBK-217F(25°C)	300,000			hrs
RoHS compliant	yes				

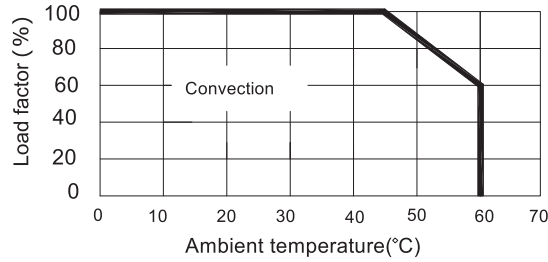
ENVIRONMENTAL

parameter	conditions/description	min	typ	max	units
operating temperature	see derating curve	-10		60	°C
storage temperature		-20		85	°C
operating humidity	non-condensing	20		90	%
storage humidity		10		95	%

MECHANICAL

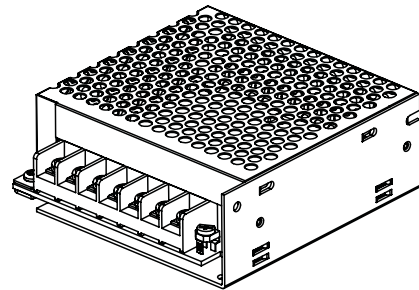
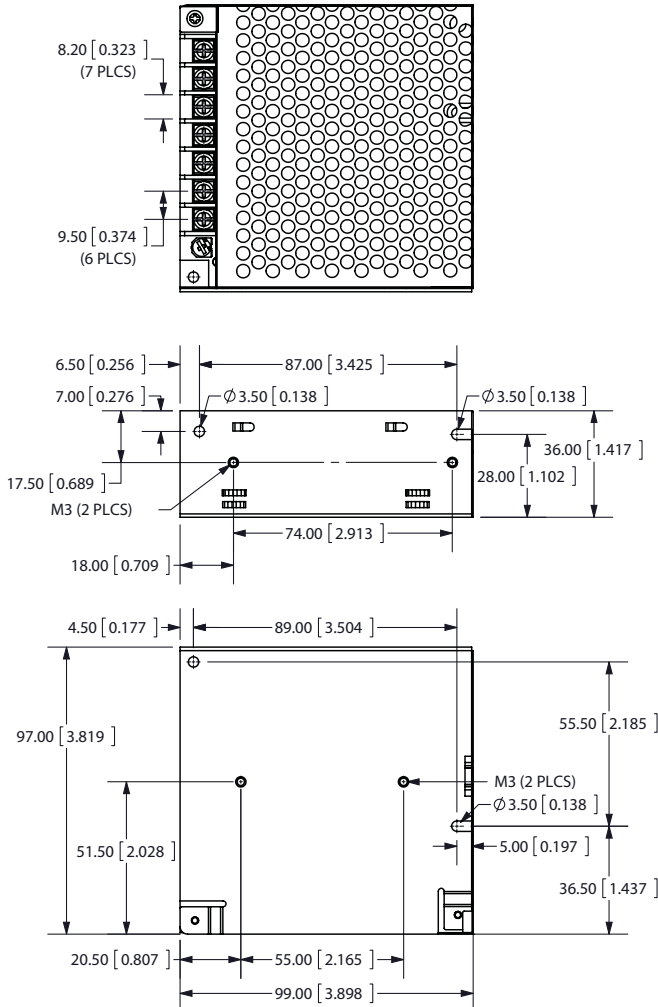
parameter	conditions/description	min	typ	max	units
dimensions	3.9 x 3.8 x 1.4 (99 x 97 x 36 mm)				inch
cooling method	free air convection (see derating curve below)				
weight			328		g

DERATING CURVES



MECHANICAL DRAWING

units mm[inches]
 tolerance:
 ±0.3mm unless otherwise specified



PIN CONNECTIONS	
Pin	Function
1	ac line
2	ac natural
3	FG \perp
4	COM
5	+V2
6	COM
7	+V1

REVISION HISTORY

rev.	description	date
1.0	initial release	10/26/2011
1.01	updated capacitor values for ripple measurements	04/20/2012
1.02	V-Infinity branding removed	08/21/2012
1.03	added minimum current requirements	11/04/2013

The revision history provided is for informational purposes only and is believed to be accurate.



CUI INC[®]

Headquarters
20050 SW 112th Ave.
Tualatin, OR 97062
800.275.4899

Fax 503.612.2383
cui.com
techsupport@cui.com

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