

NON-ISOLATED DC/DC CONVERTERS

10.3 V - 13.2 V Input / Programmable Output / 120 A VRM 10.1



Sep.1, 2011

Bel Power Inc., a subsidiary of Bel Fuse Inc.

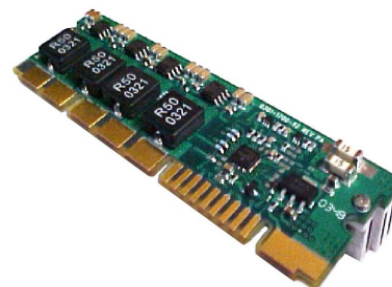
GRNC-C2A160

RoHS Compliant

PRELIMINARY

Rev.B

- High efficiency means less power dissipation
- Remote on/off
- Wide input range (10.3 V - 13.2 V)
- Wider input range available – consult factory
- 2-Wire Remote sense
- 6 bit VID digital voltage programming.
- Class2,Category2,Non- Non-Isolated DC/DC Converter (refer to IPC-9592)



Description

The GRNC-C2A Series is a non-isolated step down dc/dc converter providing up to 120 A of output current and designed to be compatible to the Intel VRM 10.1 specification. Standard features include current monitor, remote on/off, over current protection, remote sense and a power good signal. This product also makes use of adaptive positioning to improve transient response performance. These products may be used almost anywhere low-voltage silicon is being employed and a nominal 12 Vdc source is available. Typical applications include file servers, work stations and other computing applications.

Part Selection

Output Voltage	Input Voltage	Output Current (Thermal Design)	Output Current (Peak Current)	Typical Efficiency	Model Number
0.83 V - 1.6 V	12 V	105 A	120 A	82%	G7NC-C2A160

Input Specifications

Parameter	Min	Typ	Max	Notes
Input Voltage Range	10.3 V	-	13.2 V	
Input Current (disabled)	-	17 mA	-	
Input Current (full load)	-	-	23 A	
Reflected Ripple Current	-	-	400 mA	With 2 330 uF, 25 mOhm capacitor and 200 nH of input inductance.

Output Specifications

Parameter	Min	Typ	Max	Notes
Output Current	0 A -	- -	105 A 120 A	Thermal design Peak current rating
Set Point Accuracy	1.27 V	1.28 V	1.29 V	no load, excluding Adaptive positioning, VID 101101
Adaptive Positioning (Droop Impedance)	-	1.25 mOhm	-	
Ripple and Noise	-	20 mV	-	pk-pk,0 to 20MHz Bandwidth full load. Note 3
Turn on Time	-	8 mS	16 mS	
Transient Response Deviation Settling Time	- -	90mV 100mV	- -	di/dt = 5 A/uS Load step =50% of max load.
Remote Sense Compensation	-	-	±0.3 Vdc	
Output Capacitance	-	8290 uF	-	Consult factory for applications with external capacitance outside of this range

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General Specifications

Parameter	Min	Typ	Max	Notes
Switching Frequency	-	1.4 MHz	-	fixed
Dimensions Inches (L × W × H) Millimeters (L × W × H)	3.8 x 1.2 x 0.962 96.5 x 30.5 x 24.4			
Weight	53.4g			
Operating Temperature	0 °C	-	70 °C	
Non-Operating Temperature	-40 °C	-	100 °C	
Protection Features Over current Under-voltage	110% to 170% max Io UVLO Vin < 10.0V			
Remote On/Off	-	-	-	Active High
Efficiency (full load)	-	82%	-	1.3 V output , 105 A load

Voltage Identification (VID) Code

VID4	VID3	VID2	VID1	VID0	VID5	Vo (VDC)	VID4	VID3	VID2	VID1	VID0	VID5	Vo (VDC)
0	1	0	1	0	0	0.8375	1	1	0	1	0	0	1.2125
0	1	0	0	1	1	0.85	1	1	0	0	1	1	1.225
0	1	0	0	1	0	0.8625	1	1	0	0	1	0	1.2375
0	1	0	0	0	1	0.875	1	1	0	0	0	1	1.25
0	1	0	0	0	0	0.8875	1	1	0	0	0	0	1.2625
0	0	1	1	1	1	0.9	1	0	1	1	1	1	1.275
0	0	1	1	1	0	0.9125	1	0	1	1	1	0	1.2875
0	0	1	1	0	1	0.925	1	0	1	1	0	1	1.3
0	0	1	1	0	0	0.9375	1	0	1	1	0	0	1.3125
0	0	1	0	1	1	0.95	1	0	1	0	1	1	1.325
0	0	1	0	1	0	0.9625	1	0	1	0	1	0	1.3375
0	0	1	0	0	1	0.975	1	0	1	0	0	1	1.35
0	0	1	0	0	0	0.9875	1	0	1	0	0	0	1.3625
0	0	0	1	1	1	1	1	0	0	1	1	1	1.375
0	0	0	1	1	0	1.0125	1	0	0	1	1	0	1.3875
0	0	0	1	0	1	1.025	1	0	0	1	0	1	1.4
0	0	0	1	0	0	1.0375	1	0	0	1	0	0	1.4125
0	0	0	0	1	1	1.05	1	0	0	0	1	1	1.425
0	0	0	0	1	0	1.0625	1	0	0	0	1	0	1.4375
0	0	0	0	0	1	1.075	1	0	0	0	0	1	1.45
0	0	0	0	0	0	1.0875	1	0	0	0	0	0	1.4625
1	1	1	1	1	1	Output Off	0	1	1	1	1	1	1.475
1	1	1	1	1	0	Output Off	0	1	1	1	1	0	1.4875
1	1	1	1	0	1	1.1	0	1	1	1	0	1	1.5
1	1	1	1	0	0	1.1125	0	1	1	1	0	0	1.5125
1	1	1	0	1	1	1.125	0	1	1	0	1	1	1.525
1	1	1	0	1	0	1.1375	0	1	1	0	1	0	1.5375
1	1	1	0	0	1	1.15	0	1	1	0	0	1	1.55
1	1	1	0	0	0	1.1625	0	1	1	0	0	0	1.5625
1	1	0	1	1	1	1.175	0	1	0	1	1	1	1.575
1	1	0	1	1	0	1.1875	0	1	0	1	1	0	1.5875
1	1	0	1	0	1	1.2	0	1	0	1	0	1	1.6

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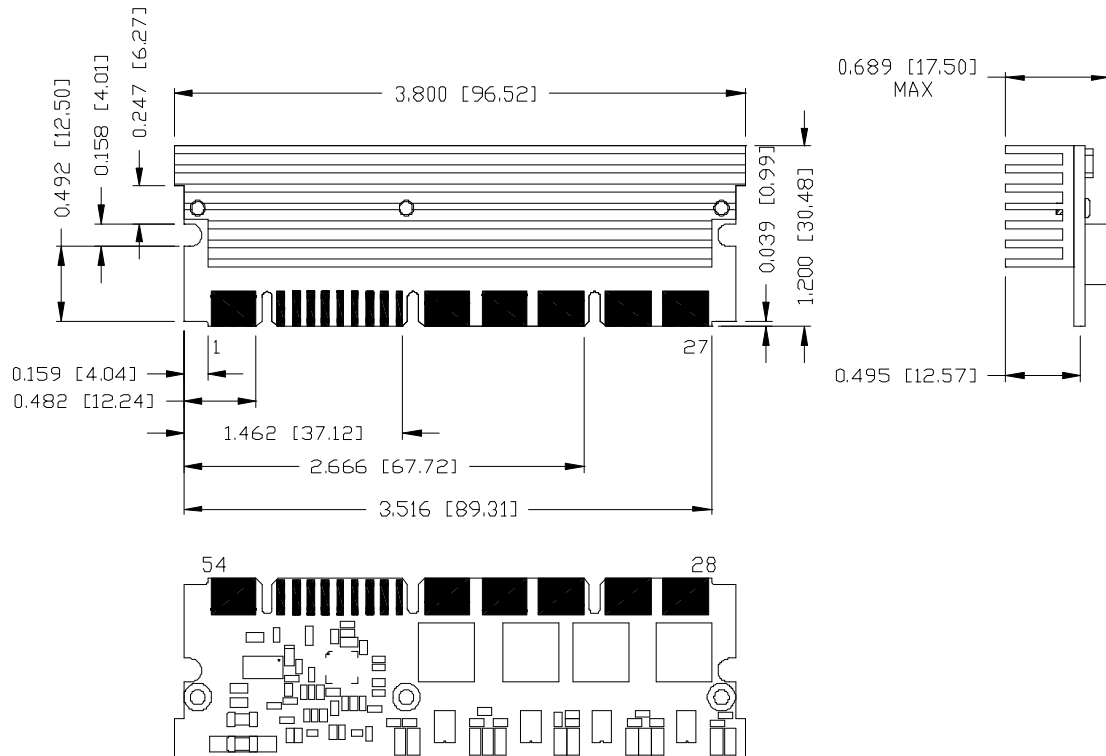
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Mechanical Outline



Pin	Function	Pin	Function	Pin	Function	Pin	Function	Pin	Function
1	GND	12	N/C	23	GND	34	+VOUT	45	N/C
2	GND	13	+VOUT	24	GND	35	+VOUT	46	LLO
3	GND	14	+VOUT	25	+VOUT	36	+VOUT	47	N/C
4	VID4	15	+VOUT	26	+VOUT	37	GND	48	-SENSE
5	VID2	16	GND	27	+VOUT	38	GND	49	VID5
6	VID0	17	GND	28	+VOUT	39	GND	50	VID1
7	+SENSE	18	GND	29	+VOUT	40	+VOUT	51	VID3
8	PWRGD	19	+VOUT	30	+VOUT	41	+VOUT	52	+VIN
9	OUTEN	20	+VOUT	31	GND	42	+VOUT	53	+VIN
10	IMON	21	+VOUT	32	GND	43	N/C	54	+VIN
11	N/C	22	GND	33	GND	44	N/C		

Notes:

1. Mechanical key between pins 3 & 4, 12 & 13, 21 & 22, 33 & 34, 42 & 43, and 51 & 52
2. Contact factory for recommended mating connector.
3. Measured with 14 X 560u 7mOhm ESR Al Poly and 45 X 10u 10mOHm ESR ceramic capacitors on output.

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Revision History

Date	Revision	Changes Detail	Approval
2011-09-01	B	Ada the mechanical drawing.	SY Qian

RoHS Compliance

Complies with the European Directive 2002/95/EC, calling for the elimination of lead and other hazardous substances from electronic products.



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