



## FEATURES

- Meets AMD K8 requirements
- DAC Programmable output voltage
- Power good output
- Differential remote sense
- Remote enable
- Supervisory functions
  - Latch off overcurrent
  - Short circuit protection
- Tri-state output when disabled
- Dynamic VID capability
- SMBus temperature monitor

## DESCRIPTION

VRK81B100CS is designed to meet the fast load transients required by AMD 64-bit processors and is fully compliant with the latest AMD64™ processor power specifications. High efficiency of 85% at full load for reduced power dissipation to simplify system thermal management. Packaged in a compact design, VRK81B100CS is ideal for use in a wide variety of server applications.

This product is a direct replacement for VRK81B080CS.

## SELECTION GUIDE

Order Code	Input Voltage	Output Voltage	Output Current	Efficiency
	V (NOM.)	V	A	% (Typ.)
<b>VRK81B100CS-1C</b>	12	0.8-1.55	100	85

## INPUT CHARACTERISTICS

Parameter	Conditions <sup>1</sup>	Min.	Typ.	Max.	Units
Input voltage operating range		10.2	12.0	13.2	V
Under voltage lockout	Turn-on threshold	6.5	6.9	7.3	
	Turn-off threshold	5.4	6.0	6.6	
	Hysteresis voltage	0.7	0.9	1.1	
Maximum input current	Typical: 80A, 1.4VID, V <sub>IN</sub> = 12V		11		A
	Max: 80A, 1.55VID, V <sub>IN</sub> = 12V			13	
No-load input current	Enable state, no load	100	200	400	mA
Disabled input current	Disabled state	10	20	50	
Enable - positive logic	On state range	0.8		5	V
	Off state range	-0.3		0.4	

## OUTPUT CHARACTERISTICS

Parameter	Conditions <sup>1</sup>	Min.	Typ.	Max.	Units
Voltage set point	5-Bit DAC controlled	0.800		1.55	V
Line regulation		-5	0	5.0	mV
Load regulation			0.6		mΩ
Voltage total regulation DC		VID-50mV		VID+50mV	V
Ripple & noise <sup>2</sup>	20MHz bandwidth, using recommended output capacitors		8.4		mVp-p
Current operating range		0		100	A
Efficiency	I <sub>o</sub> = 100A, VID = 1.325V	82	84		%
	I <sub>o</sub> = 80A, VID = 1.325V	83	85		
Turn-on time	V <sub>IN</sub> present: enable to 90% V <sub>OUT</sub>			50	mS
Recommended bulk output capacitance	560μF, 4V alum poly		8		EA
	10μF, 1206 X7R ceramic		25		

## GENERAL CHARACTERISTICS

Parameter	Conditions <sup>1</sup>	Min.	Typ.	Max.	Units
Semiconductor junction temperature	Package rated to 150°C			115	°C
Material flammability	UL 94V-0				
MTBF	Calculated (RAC PRISM)		1.303		x10 <sup>6</sup> Hrs
Switching frequency	Per phase		300		KHz

## TEMPERATURE CHARACTERISTICS

Parameter	Conditions <sup>1</sup>	Min.	Typ.	Max.	Units
Storage temperature range	Non-condensing	-40		70	°C
Operating temperature range	See derating graph	0		60	

## PROTECTION CHARACTERISTICS

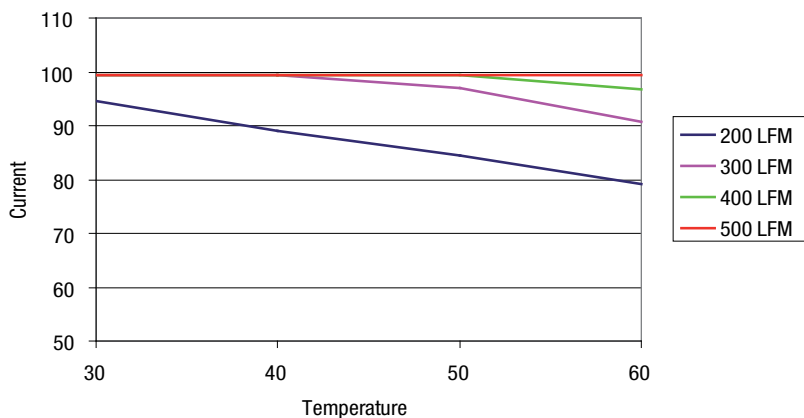
Parameter	Conditions <sup>1</sup>	Min.	Typ.	Max.	Units
Output overcurrent shutdown	Latching	115		120	A
Overvoltage Indication, CBOU <sup>T</sup>	V <sub>OUT</sub>		2.1		V

1. V<sub>IN</sub> = 12VDC, T<sub>A</sub> = 25°C, Airflow = 400LFM unless otherwise noted.

2. Output ripple voltage is specified when measured with recommended capacitance at the output of the converter.



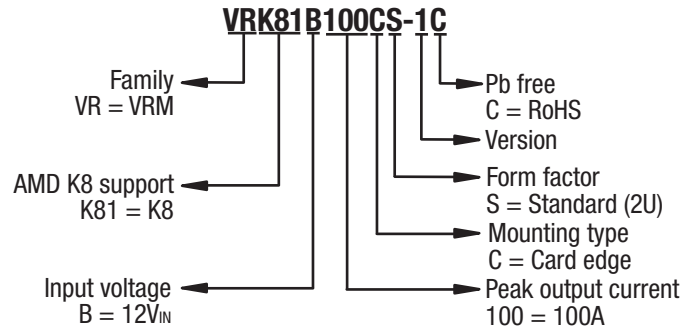
**THERMAL DERATING GRAPH**



**VID CODES**

VID4	VID3	VID2	VID1	VID0	V <sub>OUT</sub>
0	0	0	0	0	1.550
0	0	0	0	1	1.525
0	0	0	1	0	1.500
0	0	0	1	1	1.475
0	0	1	0	0	1.450
0	0	1	0	1	1.425
0	0	1	1	0	1.400
0	0	1	1	1	1.375
0	1	0	0	0	1.350
0	1	0	0	1	1.325
0	1	0	1	0	1.300
0	1	0	1	1	1.275
0	1	1	0	0	1.250
0	1	1	0	1	1.225
0	1	1	1	0	1.200
0	1	1	1	1	1.175
1	0	0	0	0	1.150
1	0	0	0	1	1.125
1	0	0	1	0	1.100
1	0	0	1	1	1.075
1	0	1	0	0	1.050
1	0	1	0	1	1.025
1	0	1	1	0	1.000
1	0	1	1	1	0.975
1	1	0	0	0	0.950
1	1	0	0	1	0.925
1	1	0	1	0	0.900
1	1	0	1	1	0.875
1	1	1	0	0	0.850
1	1	1	0	1	0.825
1	1	1	1	0	0.800
1	1	1	1	1	Shutdown

**PART NUMBER CODING**



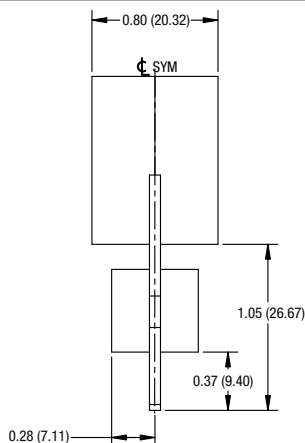
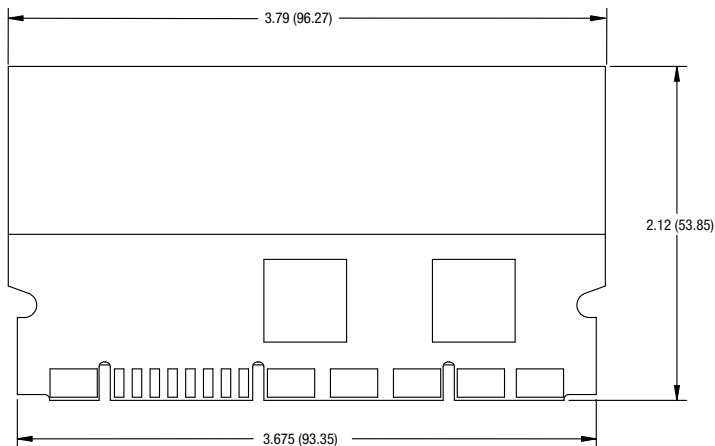
**PACKAGE SPECIFICATIONS**

PIN ASSIGNMENT				
Pin	Signal	Pin	Signal	
1	GND	54	+12V <sub>IN</sub>	
2	GND	53	+12V <sub>IN</sub>	
3	GND	52	+12V <sub>IN</sub>	
4	VID4	51	VID3	
5	VID2	50	VID1	
6	VID0	49	NC	
7	COREFB_H	48	CORERB_L	
8	PWRGD	47	CBOOT	
9	ENABLE	46 <sup>1</sup>	ADD 0	
10 <sup>1</sup>	SmDA	45 <sup>1</sup>	ADD 1	
11 <sup>1</sup>	SMC <sub>L</sub>	44	VRMPRES_L	
12	SGND	43	+5V ALWAYS	
13	V <sub>DD</sub> CORE+	42	V <sub>DD</sub> CORE+	
14	V <sub>DD</sub> CORE+	41	V <sub>DD</sub> CORE+	
15	V <sub>DD</sub> CORE+	40	V <sub>DD</sub> CORE+	
16	GND	39	GND	
17	GND	38	GND	
18	GND	37	GND	
19	V <sub>DD</sub> CORE+	36	V <sub>DD</sub> CORE+	
20	V <sub>DD</sub> CORE+	35	V <sub>DD</sub> CORE+	
21	V <sub>DD</sub> CORE+	34	V <sub>DD</sub> CORE+	
22	V <sub>DD</sub> CORE+	33	V <sub>DD</sub> CORE+	
23	V <sub>DD</sub> CORE+	32	V <sub>DD</sub> CORE+	
24	V <sub>DD</sub> CORE+	31	V <sub>DD</sub> CORE+	
25	GND	30	GND	
26	GND	29	GND	
27	GND	28	GND	

1. Optional features. Substitute "NC" if option is not ordered.

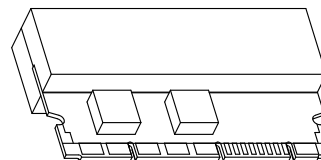
**PACKAGE SPECIFICATIONS (continued)**

**MECHANICAL DIMENSIONS**



**Recommended Interface Connector Options**

Typco/Elcon	283-0172-01303 (Solder Tail, Long)
	283-0172-02303 (Solder Tail, Short)
	284-0202-03003 (Surface Mount)



Weight: 2.08oz (59g)

All dimensions in inches  $\pm 0.03$  (mm  $\pm 0.25$ mm).